



April NATURAL HISTORY 1943

Lost Worlds Reborn • Fishing Bats • Monkey Business

Fur Seals • Fiji • Pottery-making • African Animals

PLANT LIFE

THE WORLD OF PLANT LIFE
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Photograph courtesy of Edwin Way Teale

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64 small gummed pictures in color, that may be pasted in scrap books, note books, etc. Explanatory text accompanies them.

The BOOK SHOP
THE AMERICAN MUSEUM OF NATURAL HISTORY
77th STREET AND CENTRAL PARK WEST, NEW YORK CITY

The Museum Meets the Public

WHEN science was very young, the gap between scientist and layman was very narrow. It could be bridged by a general education which was still capable of embracing all available knowledge. And the scientist was a scholar in all subjects.

As science advanced the gap widened. General knowledge fell to the bottom of the crevasse, and the layman became unable to reach across.

We have come to realize that this divorce between expert knowledge and public comprehension is one of the severest obstacles to the further progress of civilization. Our problem is how to fill the chasm so that scientist and layman may join again and move forward hand in hand towards a better future based upon a wiser use of what we know and shall learn together.

There is no general solution for the problem, applicable to all disciplines of thought. It must be separately solved for each major branch of learning. Our question is how to achieve a solution for the sciences of natural history through the medium of the public museums. What we must find or create is a common ground on which scientific knowledge meets public experience.

In their own history all sciences have sprung from such common ground. Newton watched an apple fall, and the seed of modern physics sprouted in his mind. Two entirely different, but both very feasible approaches to a renewed contact between science and layman are suggested by this incident.

We might arrange our introductory exhibits as a review of the history of knowledge from its simple beginnings in everyday experience. Science might step back into its own past to pick up the layman where he was left behind in the maze of increasing knowledge and retrace with him the path which has been followed, so that he might arrive, step by step, at an understanding of our knowledge of today. This type of historical approach has been very popular in education. But it has the drawback of poor economy of time and effort. Much of the knowledge which

was needed to negotiate the lower slopes on the climb to scientific understanding is useless at the peak, but has to be carried again when this method of teaching is followed.

A less fortunate variation of the historical approach was inspired by the theory of evolution, which states that not only human knowledge of nature, but also nature itself started from simple beginnings. We might therefore take, as our own starting point for an introduction to the sciences, the origin of the earth and evolution of life which followed. But we were looking for a common ground on which scientific knowledge and public experience of everyday life might meet. Nothing could possibly be farther from this experience, or from public concern, than the planetesimal birth of our globe or the primeval emergence of life on its surface. This approach is distinctly for the scientist himself, not for the layman. The starting point is simple only to the scientific mind but extremely remote and complex in terms of familiar, lay knowledge.

So let us return to Newton under the apple tree. Let us grant that his apple has fallen and been adequately accounted for. But let us follow his example. Let us look at the apples which fall today, the leaves that turn red in autumn, the roots that sprout in the spring, the bee that builds its hive, the chicken that will not lay eggs, the dust-cloud that rises behind the plough that cuts the prairie. Let us attempt to explain to our visitor these familiar everyday phenomena with which he is already so well acquainted. Let us try to do it by reducing the best of modern knowledge to the simplest possible terms, without cumbersome detours into the past of scientific childhood.

By so doing we would immediately break down the feeling that our subjects are futile and remote. We would create the satisfaction of a newborn understanding of things seen daily as a matter of course. We would establish a common interest and a common basis of elementary knowledge from which we can lead on into a deeper comprehension of more complex and distant things.

A. E. Barr
Director, the American Museum
of Natural History

LETTERS

SIRS:

Being an amateur archaeologist, I found your article, "How Science Deciphers Man's Past" (in the March issue, by Dr. Clark Wissler), very interesting and instructive. Even though I have long admired NATURAL HISTORY, my interest is now even greater. I can safely say that this is the best reference I have ever seen dealing with ancient aborigines. . . .

KURT F. LOESCH.

Hightstown, N. J.

* * *

SIRS:

. . . For quite some time I had been looking for some sort of a nature magazine but seemed unable to find just what I wanted. Then one evening I happened to pick up the January issue of NATURAL HISTORY at the home of a friend, and I immediately concluded that this was the magazine for which I had been looking. I decided to enter my subscription immediately, beginning with the January issue, and it was with unrestrained enthusiasm that I awaited my first issue.

It was Mr. Teale's article on insects in winter, with the excellent photographs, that intrigued me. I attended Mr. Teale's lectures in Buffalo on *Near Horizons* a few weeks ago and find that in both his writing and his lectures he has a new, attractive, accurate, yet not technical, approach to the subject. Please publish more of his entomological articles soon.

. . . In closing, let me add that I find your magazine most interesting, from the beautiful natural-color covers right through to the last page. . . .

EVELYN WERICH.

Eggertsville, N. Y.

* * *

Other unsolicited comments of the month:

"I wish to tell you how much pleasure your NATURAL HISTORY Magazines have given me, not only for their popularity but for their scientific interest as well."

* * *

" . . . your publication is one of the best on the market."

* * *

" . . . You have an excellent magazine, and I hope its standard of excellence can be maintained during these difficult times."

* * *

"NATURAL HISTORY has brought great pleasure to myself and family. Every issue maintains its value. . . ."

* * *

" . . . I should like to congratulate you on this magazine, which is really excellent."



SIRS:

After reading the interesting story about "Ivan and Abdulla" in the March issue of NATURAL HISTORY Magazine, the thought came to me that you might be interested in an albino of a different kind. This is

a Florida striped skunk (*Mephitis elongata*), a true albino (not a black hair could I find), with pink eyes and pink toenails. The defense glands had been removed.

J. M. HOLLISTER
Schenectady, N. Y.

SIRS:

I can't help expressing my particular appreciation for Doctor Pope's "Ivan and Abdulla," as it carried me back to my boyhood pets. I had most of our local wildlife from 'coons to rattlesnakes, but one of the most interesting and amusing was a female 'coon raised on a bottle as were the two albinos. . . .

I never saw any mammal imbued with more curiosity than my pet 'coon. One day I brought a large 'possum home and laid it down to see what the 'coon would do. There lay the 'possum playing dead, with eyes closed, mouth open, and saliva dripping. The 'coon immediately started investigation by running first one arm down the 'possum's throat, then the other. But she next made the mistake of her life. She stuck her nose in. This was too much for the 'possum, which clamped down on

her. When I had pried the 'possum's jaws open, the 'coon went up the nearest tree like a scared cat, and it was several hours before I could coax her down.

The thing she enjoyed most was a boat ride and frog hunt. She would sit in the bow while I paddled the boat close to the river bank, and she never missed seeing and capturing a frog. She would swim back to the boat, climb in, and devour the frog; then she would take her place in the bow to watch for another.

One amusing thing she never failed to try to do was to wash a toad until it was fit to eat. She would scrub and scrub, then put it in her mouth and froth as if she had a mouthful of soap. Back would go the toad for another washing and another taste. She would look at the toad with a puzzled expression as if to say what kind of a frog was that. . . .

With best wishes for the continued success of NATURAL HISTORY, which no home should be without. . . .

D. P. LE FEVRE
State Roads Commission,
Cumberland, Md.

NOTICE—Readers are encouraged to submit their own photographs of natural history subjects. Those selected for publication on this page will be paid for at \$1.00 each, with full credit to the photographer. Return postage must be included.

SIRS:

The enclosed photographs of Indian Pipes were taken and finished by a young nephew in Ottawa, Canada, who sent



▲ INDIAN PIPES have lost all their green coloring matter, or chlorophyll, which plants need in order to manufacture food from the soil. Lacking this, they have to live on dead organic material. Thus they are called saprophytes, in distinction to parasites, which derive their sustenance from living organic matter



Photos by Stanley Metcalfe

The rationing of paper and other materials used in magazines and books is a circumstance to which publishers throughout the country are adjusting in the concerted effort to hasten victory and peace. Already there are fewer pages in NATURAL HISTORY Magazine; further reduction may be necessary. Readers are

asked to be patient if conditions beyond our power interfere with the normal production of the Magazine. The materials and energies diverted are being applied to the task of saving, among other things, the American ideal of freedom and truth in public education.—ED.

them to me, knowing my enthusiasm for wild flowers in general and the charming Indian Pipe in particular.

When Royal S. Kellogg, who is a member of the Museum, saw them, he suggested that your magazine might be able to use them.

Stanley Metcalfe is about 17 years old and has been an enthusiastic and clever amateur photographer for several years. He is especially interested in plant and insect life as subjects.

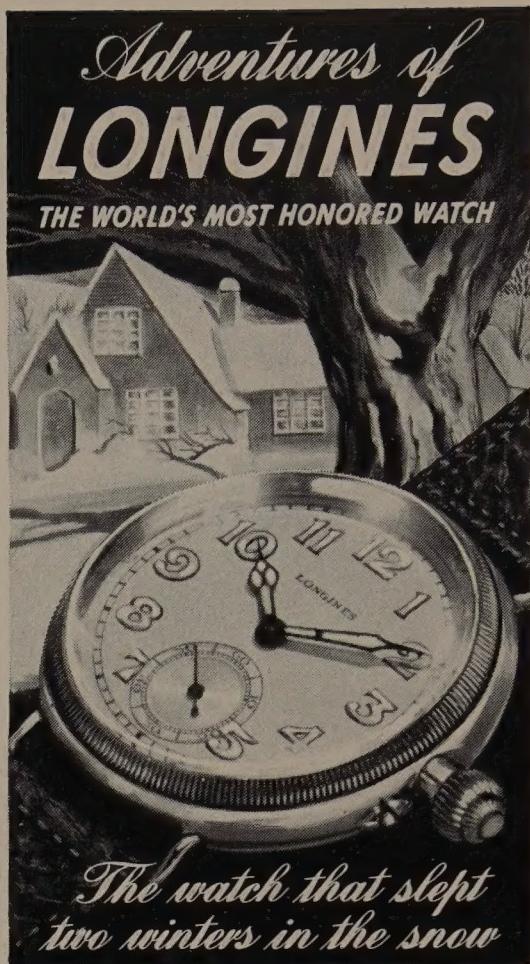
W. G. MACNAUGHTON.

New York, N. Y.



▲ THEIR white, waxlike appearance leads some persons to suppose that Indian Pipes are fungi, like puffballs and mushrooms. But they are flowering plants, and they produce seeds. Strangely enough, they belong to the Heath family, along with the blueberry and huckleberry. As the seeds ripen, Indian Pipes straighten up . . .

◀ . . . UNTIL at length they might better be called Indian Cigarette Holders. They make attractive table decorations and will survive indoors if taken with the roots. They must not be handled, however, because they turn black when even slightly bruised, as can be seen to a small extent in the photograph above. They also blacken on drying



*Adventures of
LONGINES*
THE WORLD'S MOST HONORED WATCH

*The watch that slept
two winters in the snow*

In 1910 a New York banker got this Longines watch as a birthday gift. He was proud of it because it was one of the first Longines "moisture-proof" watches to be made. Then he lost it and two winters were to pass before he would see it again.

One day his son was mowing the lawn when something shiny on the ground caught his eye. It was the long lost watch, none the worse for its long sleep of two winters in the snow. His son wears it proudly today, a very perfect timepiece that has run for 31 of its 33 years of life.

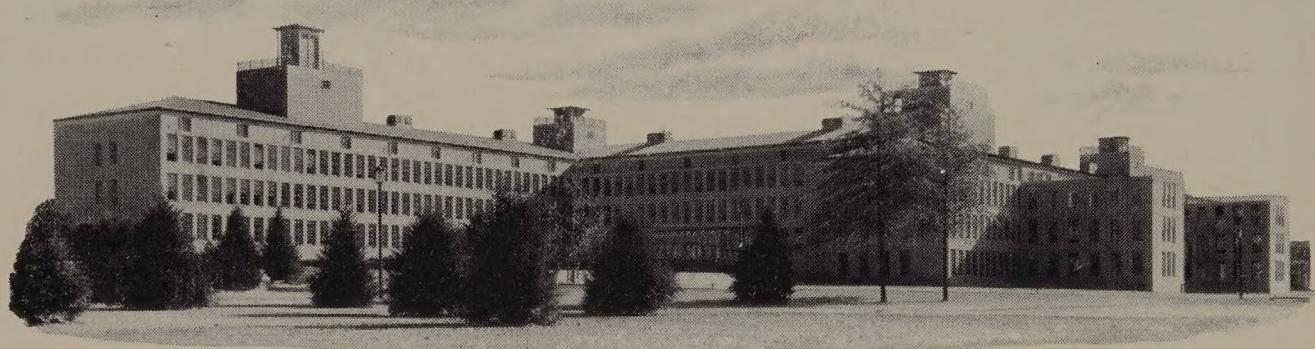
The experiences of hundreds of thousands of Longines owners have made the reputation of Longines watches for keeping good time for a long, long time. It is a reputation that has been abuilding for 77 years.

Longines-Wittnauer Watch Co., Inc., New York, Montreal, Geneva; also makers of the Wittnauer Watch, a companion product of unusual merit.



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facilities are the greatest in the world. And they are functioning.

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NATURAL HISTORY

The Magazine of the American Museum of Natural History

FREDERICK TRUBEE DAVISON, President

ALBERT E. PARR, Director

VOLUME LI—No. 4



APRIL, 1943

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FROM ROCK TO

By JOHN C. GERMANN

Staff Artist, American Museum of Natural History

How the scientific artist brings
a prehistoric animal to life

► A DRAMATIC example of the challenge and inspiration in reconstructing lost worlds: remains of the prehistoric animal named *Scarrittia*, which enabled science to fill in a gap in the story of ancient times



AMNH Photo

Six steps leading to the artist

1. Fossils are found in most parts of the world, but the chief problem is getting at them. The master fossil-exposer is erosion, which scours away the surface of the earth, especially in badlands and deserts. The scientist has been quick to learn this. You are apt to see him in gullies like those shown below, searching in the bright silence for fossils—the fragments that form the tattered pages of the earth's history

is splinted and bandaged with cloth dipped in flour paste or plaster. Then it is crated and shipped

4. In the laboratory a preparator removes the bandages and carefully chips away the encasing rock

5. The scientist now studies the fossil. He compares it with many others and draws upon the published findings of other scientists working on similar problems. He and the artist frequently confer, for it becomes evident that a restoration will be possible

6. Before putting brush to canvas, the artist must diagram the anatomical features that make this animal different from others living and dead. Only when he has made detailed sketches of all its unusual features does he feel free to proceed with the over-all restoration

2. The end of a bone protruding may be his only clue, but removal of the surface occasionally reveals a complete skeleton. The material encasing it may be soft sand or rock much harder than the specimen itself. Special brushes, awls, and chisels are used in uncovering it

3. When the specimen is cut free, it

1. EROSION

John S. Nichols



2. DISCOVERY

AMNH photos



3. BANDAGING



FOUND in an extinct ash-filled crater in Patagonia, this heavy-limbed beast had lain in its tomb for some 30 million years. Its sturdy, massive head and shoulders suggest the slow, calm manner in which it grazed over its prehistoric landscape. The beast's fore legs are longer than its hind legs, giving it a sloping back, which ends in a stubby anticlimax of a tail.

The country where our animal lived was in general a gentle, rolling land, covered with good pasture. The slow-moving animals must have been content as they traveled along in loose-knit herds, apparently having little to worry about.

However, as spring passed into deep summer, the intense sunlight that warmed them dried up the shallow pools of water dotting the plains. Day by day, thirst forced the grazers to wander farther and farther afield.

We shall probably never know exactly when and how they first discov-



A.M.N.H. Photo

▲ TRAIL'S END: the past re-enacted. Drawing on the resources and detailed studies of specialists, the artist reconstructed in full the scene of an ancient tragedy, as described below

ered the lake in the volcanic crater. Perhaps some strong, young animal, attracted by the fresh, cool currents of air blowing down from it over the hot, dry plains, led the little band up through the break in the rim of the crater.

The herd, plodding over the dusty slopes, probably broke into an awkward run at sight of the lake. The older and wiser animals scanned the bowl of the crater perhaps for signs of danger but, seeing none, proceeded to the water, drank deeply, and fell into the restful mood of that silent place.

The herd lingered on through the

closing hours of the hot afternoon, refreshing themselves on the water, and were tempted to rest in the coolness of the lengthening afternoon shadows. Then a strange thing came to pass.

With the setting of the sun, the breeze of that long-ago day probably dropped to a flat calm, even as it so often does today, and thin vapors rose from cracks in the floor of the sleeping volcano. The fissures had doubtless been hidden until now by the strong sun glare. And though the vapors had been issuing all along, the breeze had carried them harmlessly away. As the air grew calm, the deadly

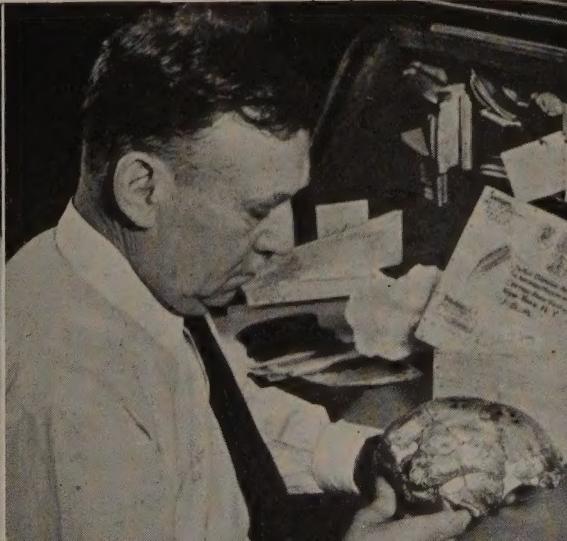
fumes started to fill the bowl of the crater from rim to rim. The animals that lingered were doomed. Those lying down succumbed first, entering upon their age-long sleep as the deepening vault of blue slowly changed to the velvet black of night.

The salient features of the landscape above are based on actual geologic evidence. The weathered rim of the volcano is still traceable today. The ancient lake is gone, but its bed, consisting of sediments deposited by the long-gone water were traced and mapped at the time the animal was discovered by the well-known paleontologist, Dr. George Gaylord Simpson. The volcanic gas vents, or fumaroles, which killed the animals are a common feature in similar craters today and can be studied in many parts of the world.

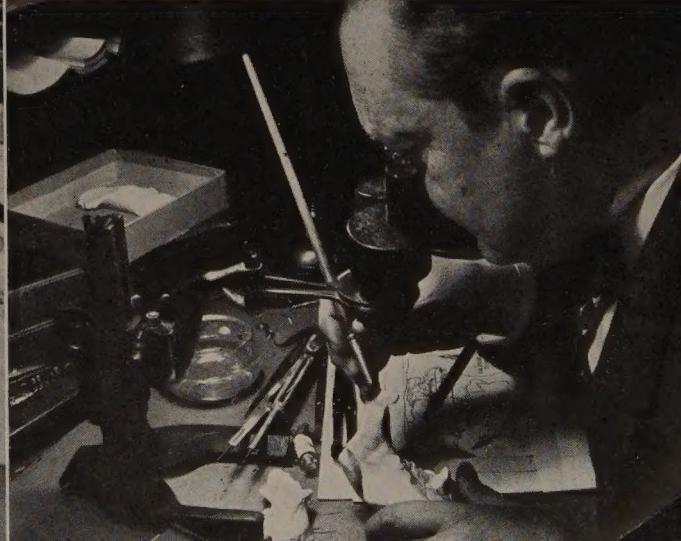
4. PREPARATION



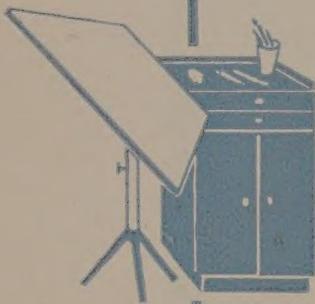
5. STUDY



6. THE ARTIST

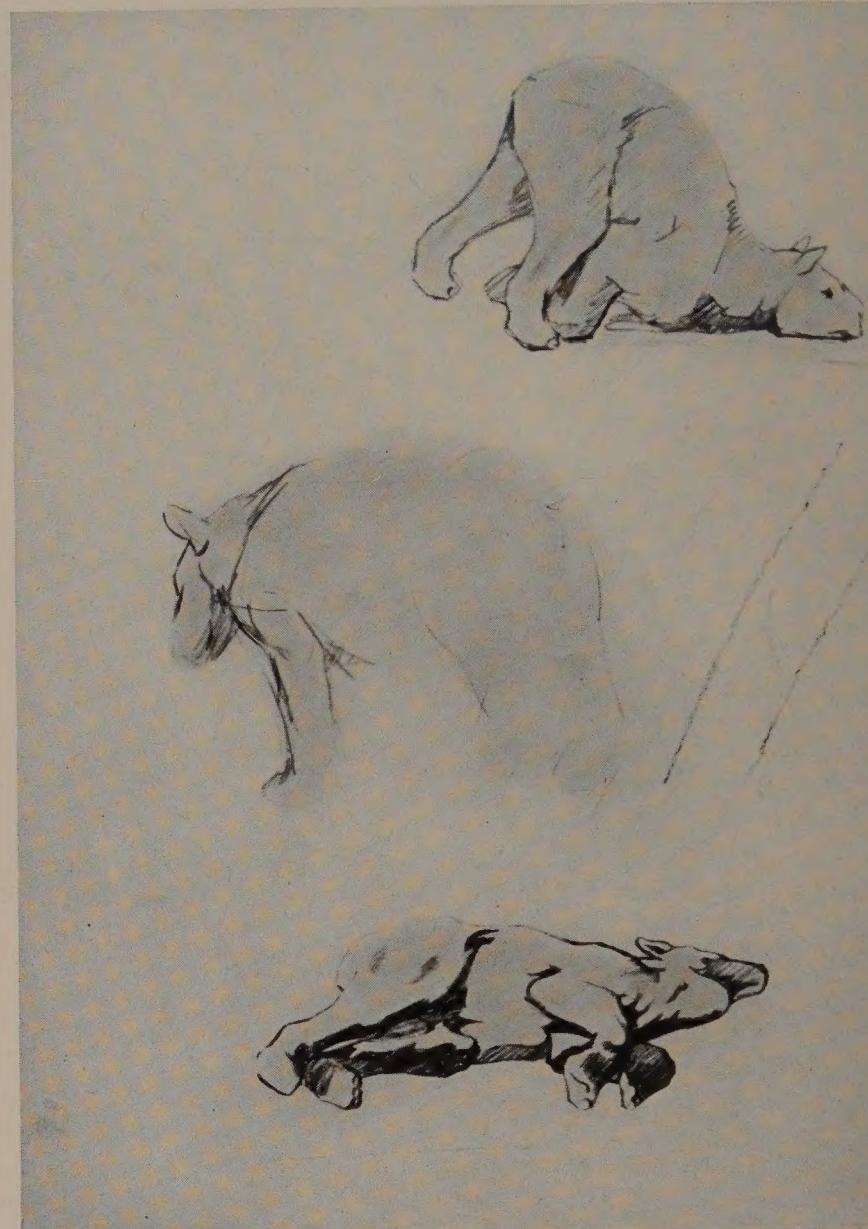


Preliminary Sketches



THESE informal drawings illustrate the interesting sort of problems that arise and must be solved before the actual drawing is undertaken. The question was how to represent this animal succumbing to the poisonous fumes known to have killed it in the volcanic crater described on the preceding page.

Some modern animals drop their forequarters to the ground first, others their hindquarters. But since *Scarrittia*'s family tree vanished from the earth many millions of years ago, it was impossible to draw from existing forms. It was a safe assumption, however, that if the gas hung low to the ground, those animals that were drinking would have fallen first. So the poor creature was sketched in every conceivable posture that the known facts of his anatomy would permit, before the most realistic and likely pose was chosen.



The Reconstruction of a Prehistoric Rodent

TOMORROW the animal will sit for its portrait. That is a big day for the scientific artist, and if you look in upon him you may sense that it is. Much has gone before, and he is eager to begin work on the final task.

Were he about to paint the portrait of a person, he might be thinking how great was the responsibility of putting a likeness on canvas for posterity. As it is, he feels a great responsibility, but time is reversed. He is about to bring an animal to life that has been dead for 40 million years—an animal that no person living or dead has ever seen, an animal that will be viewed "in the flesh" for the first time on his canvas.

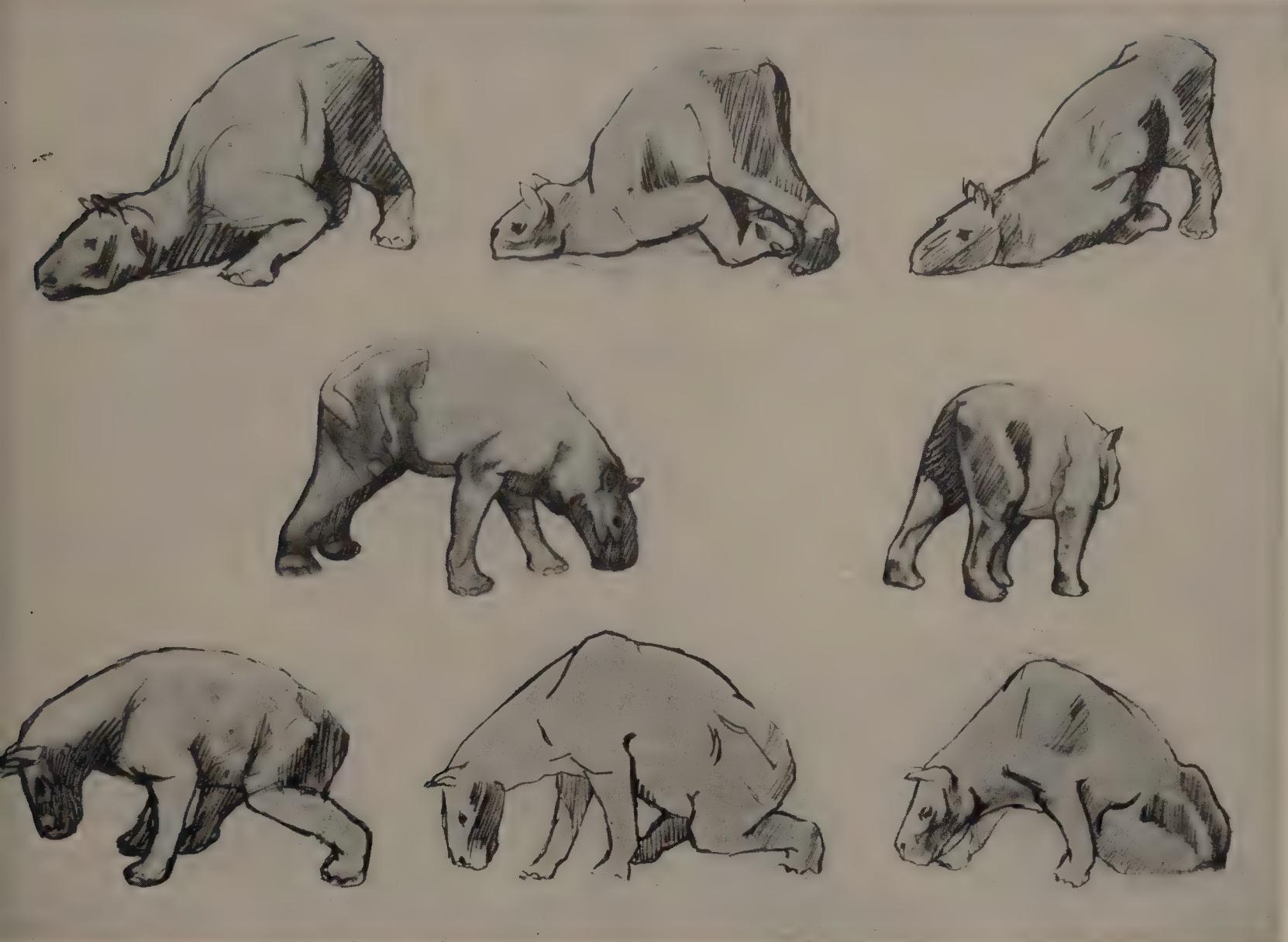
When Leonardo da Vinci examined a sea shell imbedded in the rock of

a mountain top, he rightly concluded that the rock of that mountain had once formed the floor of the sea. His trained observations and logical deductions told him that the creature which once occupied this shell must have lived in the sea. The ocean had not visited the mountain within the memory of man; there was only one conclusion to draw. This shell was very, very old—so old that it had turned to stone and was a fossil.

So it was that an artist was among the first men to be intrigued by the study of paleontology. He was a forerunner of the students to come, and his work indicated the basic requirements for this most fascinating science—trained observation and the ability to link together fragments of a remote past.

You will see that our scientific artist knows exactly what he is doing. After the long hours of backbreaking work by the fossil diggers, there followed seemingly endless weeks when specialists sorted and studied the material in the laboratory. All the science that went before into the restoration of animals related to this one is reapplied with new insight.

We see him revolving a skull in his hands, holding it in one position and then another to change the lighting. Now and again he comes back to a particular spot on the bone, which has occupied his attention for many days. In a tray near by lies a small fragment of bone. He examines the surface of the skull through a low-power binocular microscope. The lines he has been drawing on it form a



pattern. He fits the small bone onto the large, and we see him relax. He is certain of its position. He knows how the jaw should hang, where the muscles were attached, how it moved in life.

The light has grown dim by now, and the skull will have to wait until morning for the exciting work of drawing the portrait. Unlike the impatient tribe to which the artist belongs, the skull has had much practice in waiting. Some 40 million slow years of measured sunsets have gone by since it started its career as a fossil.

There had been a quick, swirling flood and a landslide, then darkness—and the everyday worries of our animal of long ago were at an end. When the floodwaters subsided, he was definitely started on the way to

becoming a fossil. Deeply buried, he was well protected from the attacks of wind, sun, and flesh-eating beasts. The underground forces disposed of the flesh and neatly applied the proper minerals to replace the bone.

The land where a stream had flowed became a lake bottom. The lake, in turn, dried up, and the plant world grew over the deeply buried fossil. Mountain ranges came into being and cut off the moist winds that nourished the plants. The plants died, and the landscape became a desert.

The infrequent rains were no longer gentle but came once more as brief, violent downpours. With no plant roots to protect the earth's surface, erosion, the master carver, took the stage. Thus began the long but final phase of our fossil's return to sun-

light. One day a corner of it emerged from a bank into the air of the outside world.

That is where an explorer found it. If he had not, the air would in time have destroyed it beyond recovery.

To realize how exacting is the thought and work that goes into the restoration of a prehistoric animal, you would have to follow the specimen from the place where it was discovered into the laboratory and thence to the artist's studio. This is a long trail. Every step is performed by people who are as much intrigued by this vocation as is the man who is to do the portrait. A quick summary of these earlier steps in its journey to the artist's studio is given at the bottom of the preceding spread. Here we pick up the story and carry it on.

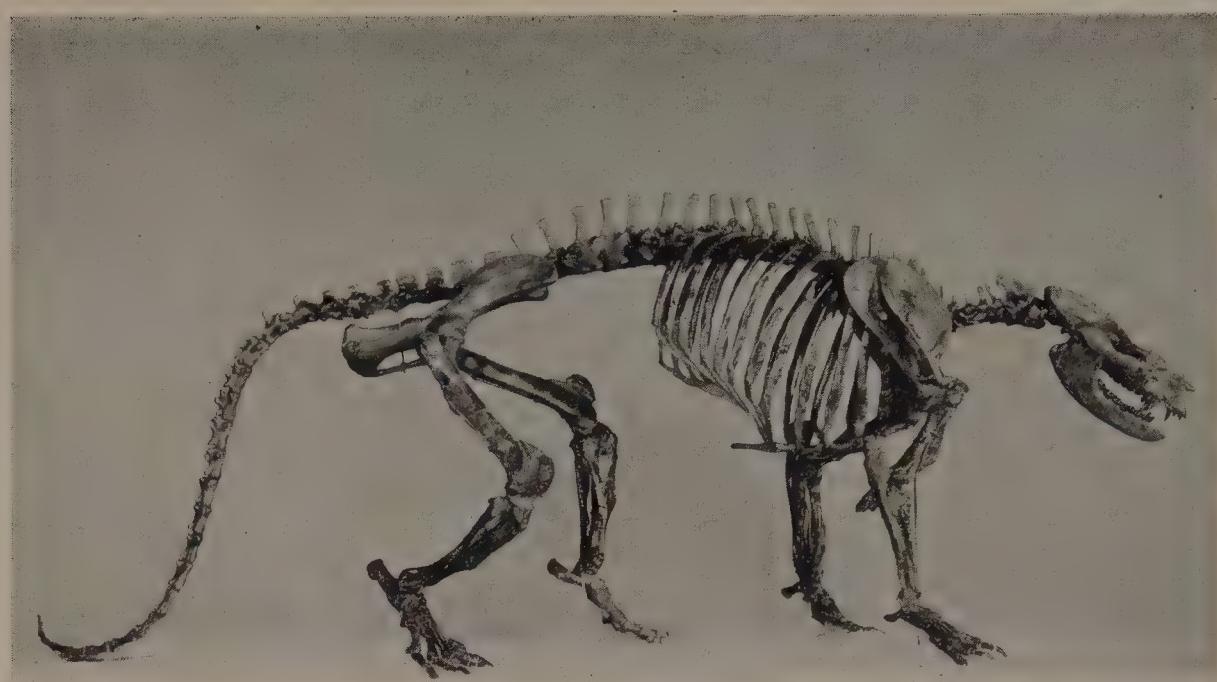
Bone to Muscle to Fur



THE SMALL BONE marked in color on the skull above was the key to the facial lines of *Manitsha tanka*, a prehistoric rodent. Days of close work were needed in order to fix its position so that the artist could place the animal's jaw and draw in the musculature on the center sketch. Only then could he clothe the face properly with fur as in life (*below*)

Three Stages

THE SAME TRANSITION from skeleton to musculature to fur is shown below as applied to *Ectoconus*, whose rebirth on canvas is traced step by step on the following pages. *Ectoconus* is one of the oldest mammals to be seen mounted in any museum



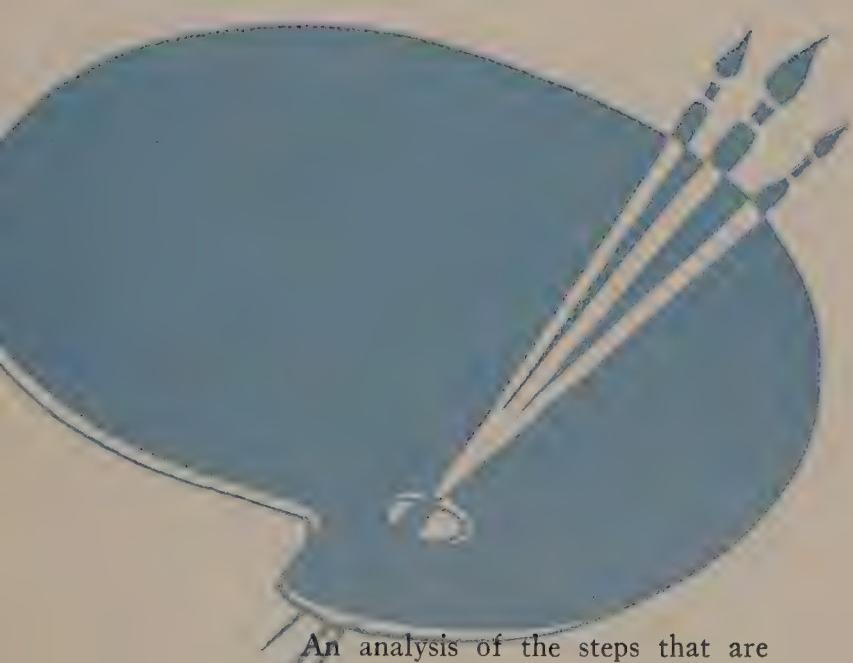
UNLIKE AN ARTIST portraying a modern animal, the one working on a prehistoric creature must start with the bare skeleton. With great inventive and mechanical skill the laboratory artisan has put this mass of brittle fossil remains together in a correct and lifelike striding posture (*top picture*)



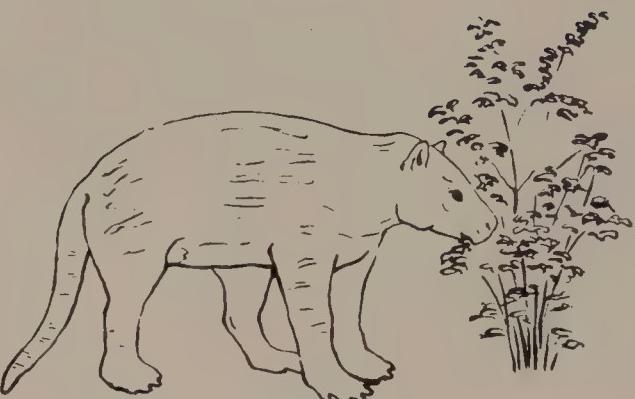
► THE POSITION of the muscles, often all but obliterated by time, must be determined, often with the assistance of the comparative anatomist

► WITH THE OUTER LAYER of muscles in place, there remains the problem of giving the animal its rightful covering. In the case of some animals actual fragments or impressions of the hide have been preserved. But if these are lacking as is usual, the climate in which it lived and a host of biological considerations are taken into account. The artist is now ready to place the animal in its proper background and render the entire scene in full color

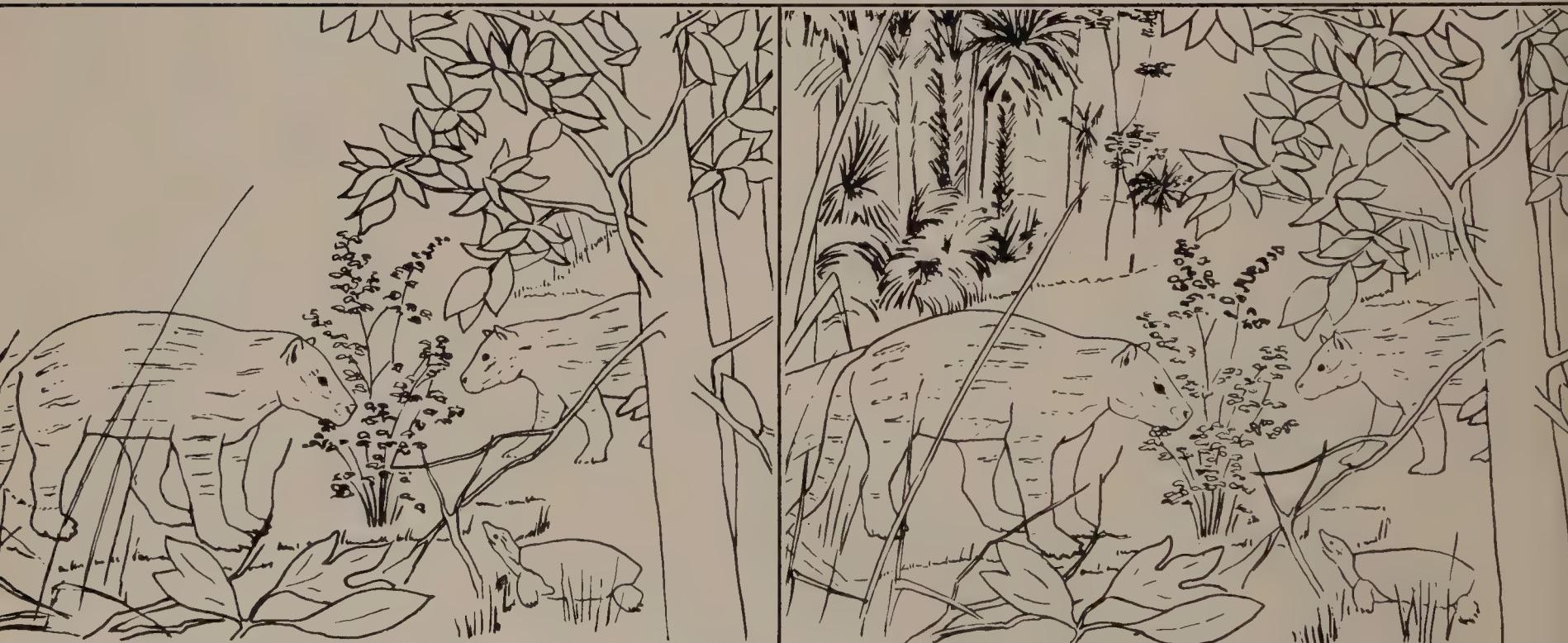




An analysis of the steps that are taken in a complete restoration must surely dispel the old fable of the mad scientist retreating to a secluded tower with a small fragment of fossil bone, emerging some time later to startle the world with a model of a strange creature complete in all details. As you have seen on the preceding page, almost the entire skeleton of the animal was at hand. The remaining steps in the process are all performed with as much care as were the earlier ones.

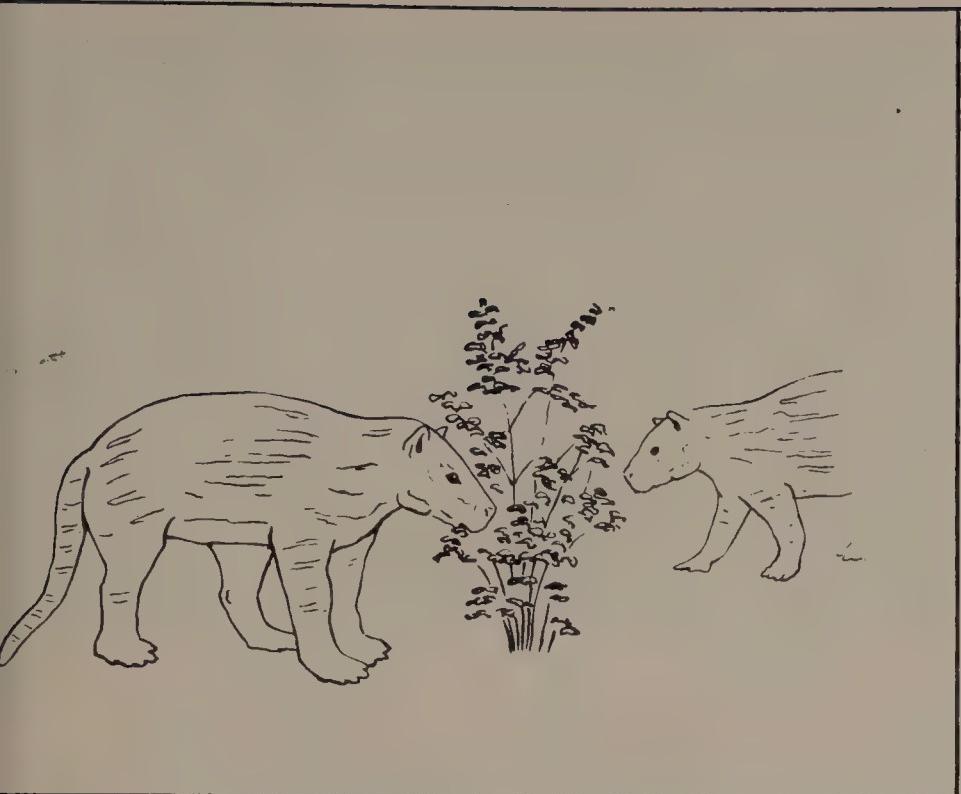


▲ THE FIRST STEP is to choose a pose that will portray the characteristic physical features of the animal to best advantage. The animal must also be placed on the canvas in such a manner as to form an interesting and pleasing composition



▲ IN ORDER TO SHOW the relative size of the animals and at the same time give authentic variety to the environment, a soft-shelled turtle was placed in the foreground. This familiar turtle is found in the same geologic formation as *Ectoconus*.

▲ CERTAIN PALMS were also known to have existed during the time *Ectoconus* was on earth. These and other tropical growth were placed where they would lead the eye out into the more open country beyond the forest. The question of whether such a palm would grow near such a moist locality as is depicted for *Ectoconus* was satisfactorily answered, and the finishing touches were put on the picture



▲ NEXT, in order to lead the attention from the central feature of the picture into the surrounding country, it was decided to include a partner for *Ectoconus*. This second animal, walking into the picture, would serve to show *Ectoconus* in motion, and his entry would suggest a larger extent of marginal forest than could otherwise be indicated



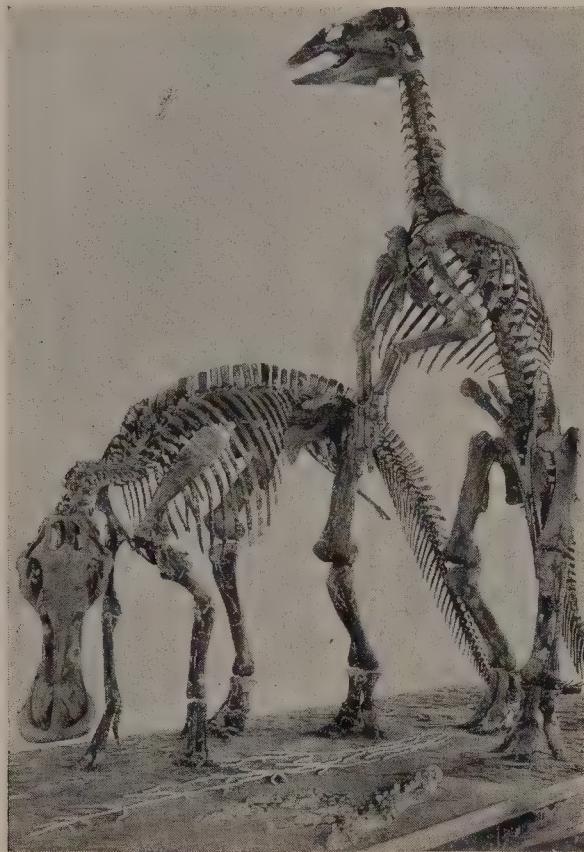
▲ THE EVIDENCE revealed that *Ectoconus* lived among trees of a sort whose descendants flourish today—the chestnut oak. In including this vegetation in the scene, a position was chosen where the tree would be clearly discernible and where a rather strong balancing area happened to be needed

▼ THE COMPLETED PAINTING shows a prehistoric scene which human eyes never beheld, yet it is scientifically accurate in all essential details. Such a painting

takes longer than one of, say, a pair of cows in a field, but the artist who penetrates the dark corridors of time takes a special satisfaction in his accomplishment



▼ THE DINOSAURS are representative of a vast host of cold-blooded creatures that overran the earth long before the appearance of the remote ancestors of our present-day animals. The three illustrations reproduced here show how the artist, before painting an animal, makes a complete model of it, using the mounted skeleton as a basis

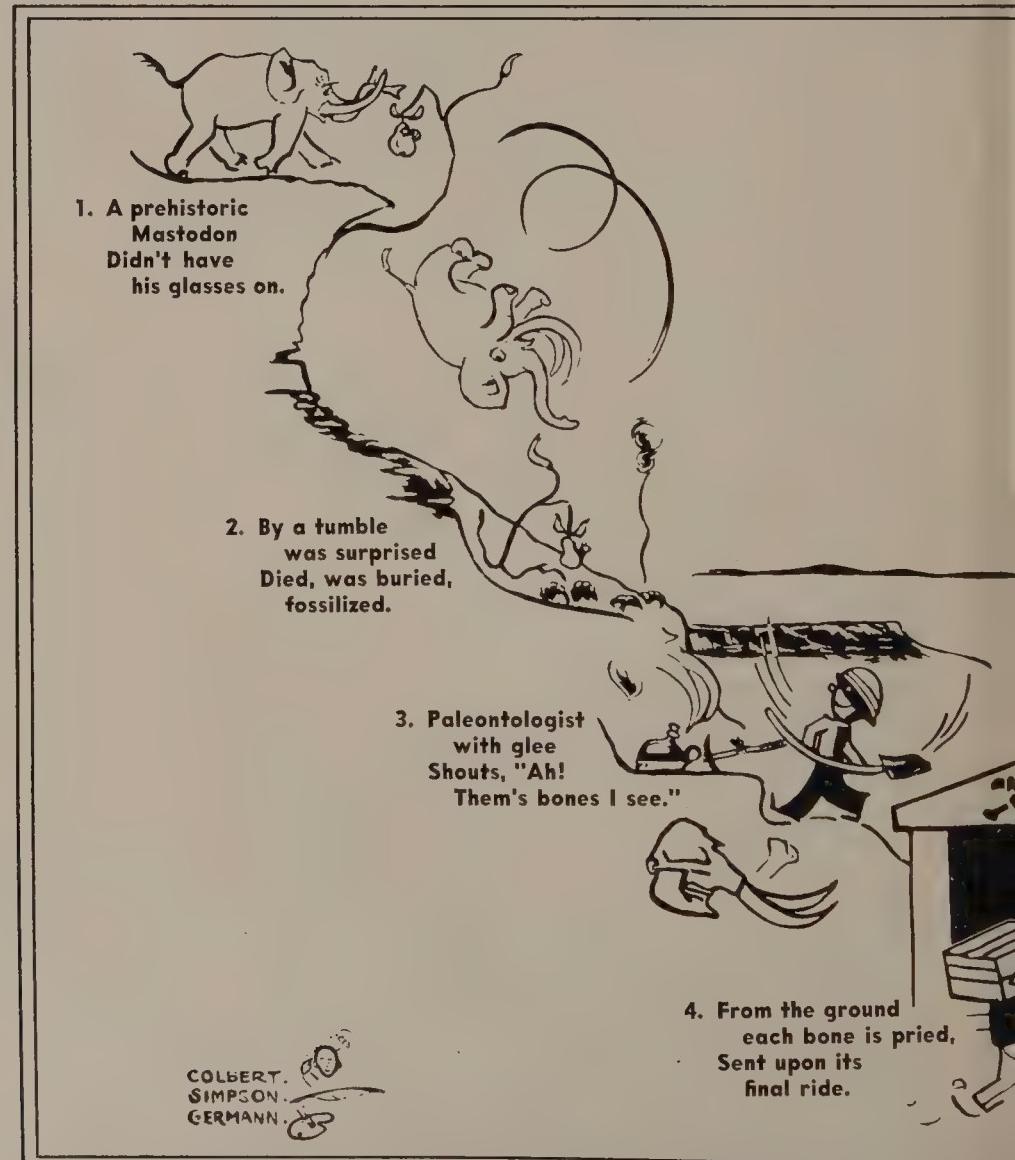
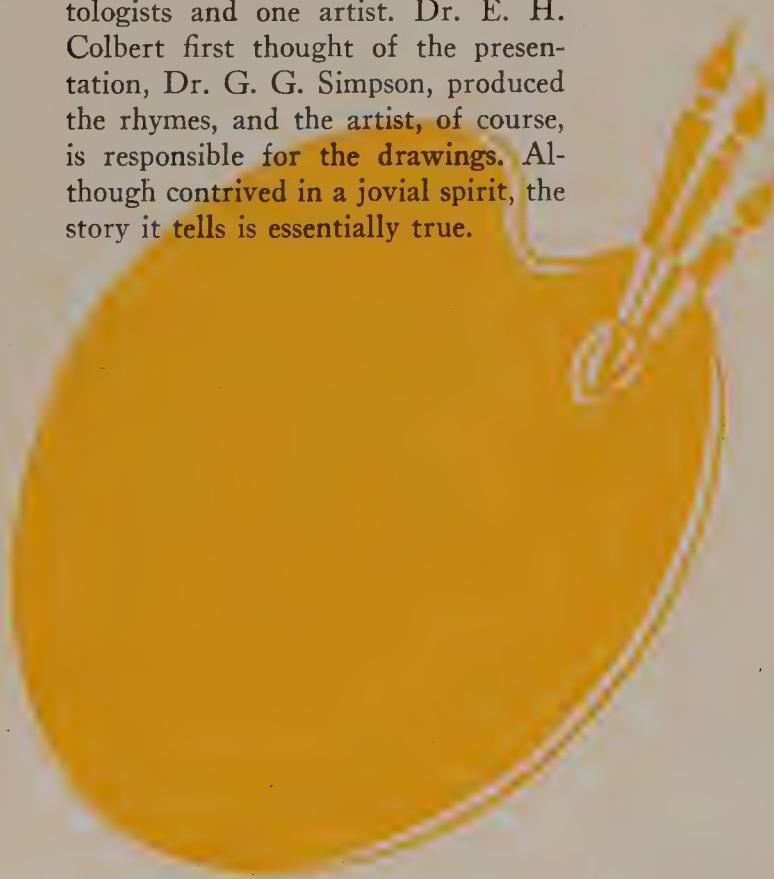


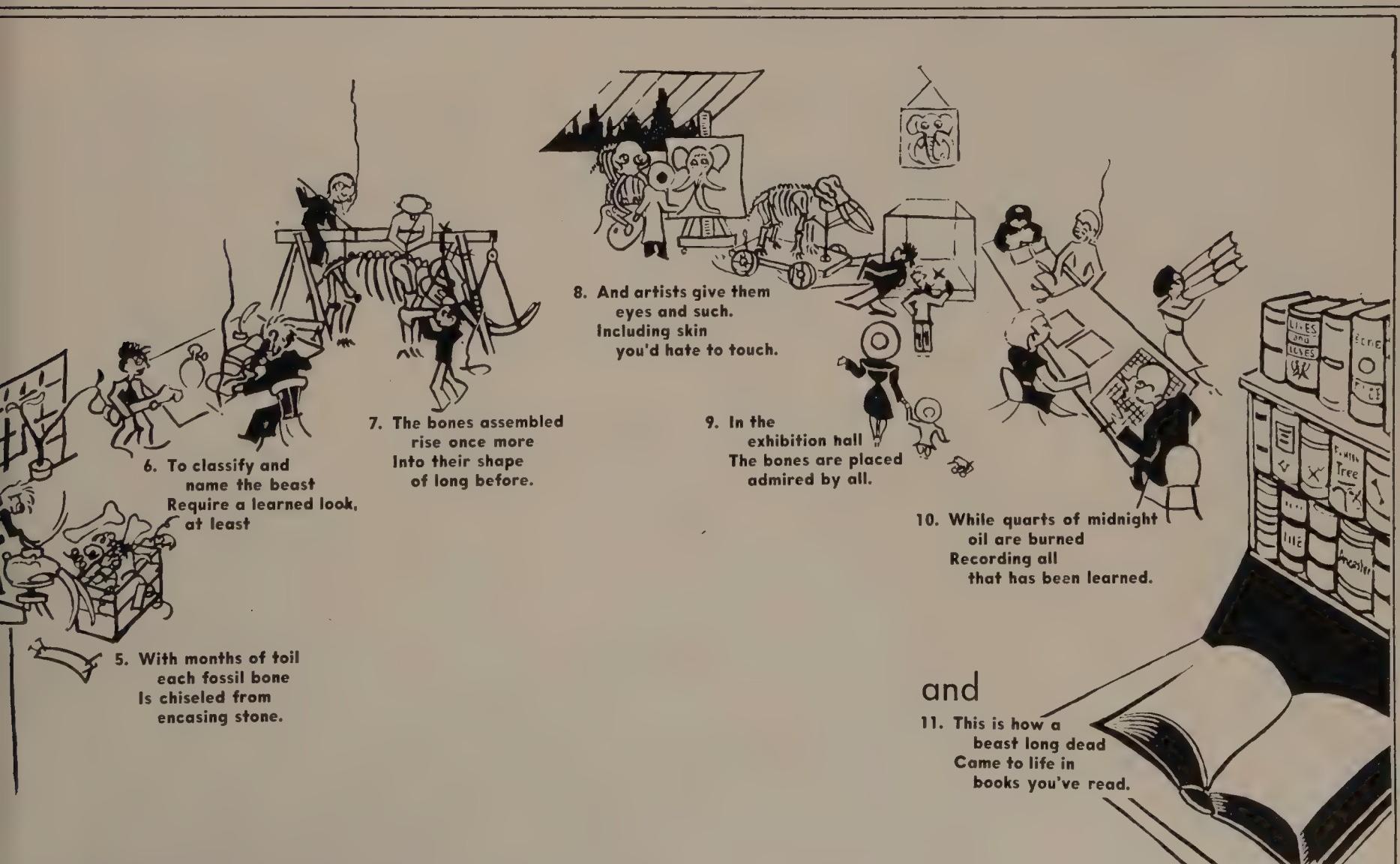
A.M.N.H. Photo

▲ WITH THE SKILL of an anatomist and the balanced judgment of a truly great artist, Charles R. Knight created these models primarily to enable him to get the proper distribution of light and shadow in his final painting

► THE FAMOUS KNIGHT RESTORATION of this dinosaur, *Trachodon*, from the Age of Reptiles, demonstrates the soundness of the artist's judgment and more than justifies the care used in his approach to the subject. Without the models it might not have been possible to achieve the intense realism of this masterpiece

FOR a quick review of the science of rescuing prehistoric animals from oblivion, the following pictorial condensation in a lighter vein is offered. It is the work of three men—two paleontologists and one artist. Dr. E. H. Colbert first thought of the presentation, Dr. G. G. Simpson, produced the rhymes, and the artist, of course, is responsible for the drawings. Although contrived in a jovial spirit, the story it tells is essentially true.



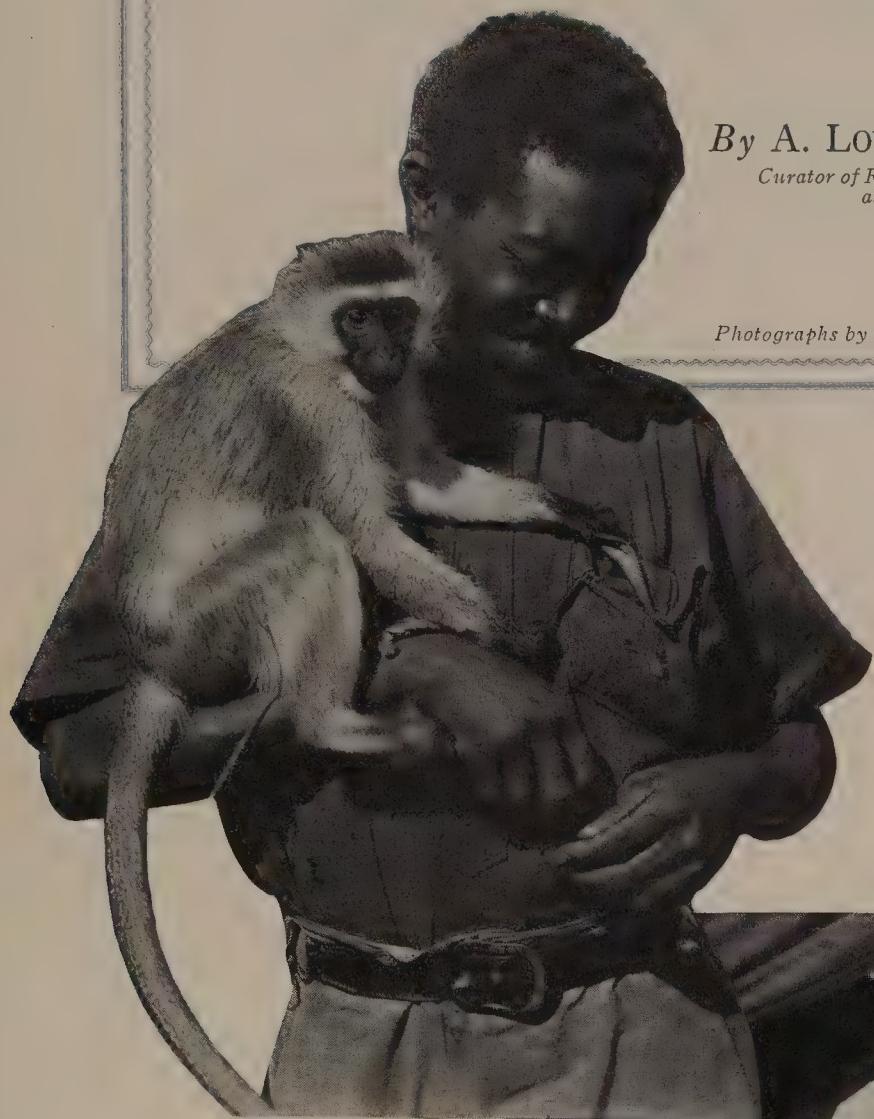


Monkey business

By A. LOVERIDGE

*Curator of Reptiles and Amphibians
at Harvard's Museum of
Comparative Zoölogy*

Photographs by Carl Akeley



▲ CURIOUS, intelligent, and impetuous, the green monkey or guenon attracts the attention of all who see him. These primates have lightweight bodies and long legs and arms

► "VANITY, VANITY"—is it in the monkey too? He dearly loves a mirror, but is puzzled and intrigued by what he sees

Most captive animals are glad to return to the wild, but even war may fail to dislodge the guenon monkey from the scenes where it learned to live with man

WHEN you hear of war sweeping through a land, your concern is usually for its effects on the human family. Few ever pause to consider what becomes of family pets and zoo denizens. Pet-keeping in the tropics is much more commonplace than in temperate climes, where circumstances tend to restrict it to such prosaic creatures as the cat or dog, canary or parrot. Should you land at an East African port, for example, there is a reasonable chance of your being accosted by a native who has a *tumbili* for sale. *Tumbili* is the Swahili equivalent for Johnston's Guenon.* This is the commonest of African monkeys, *Cercopithecus aethiops johnstoni*. The little fellow has a buffy-olive colored coat, a grayish-white waistcoat, white eyebrows, and an alert black face.

When the tide of war rolled over German East Africa (now known as Tanganyika Territory) in 1916, the retiring Germans liberated many of their captive animals. In such circumstances most creatures gladly revert to



a feral life, but not the monkeys! It is probable that their own kith and kin refuse them admission to their roving bands. Be that as it may, the fact remains that the liberated monkey becomes a mere hanger-on of mankind—a simian parasite for the nearest humans, whose company he craves yet hesitates to share.

My first acquaintance with such a foot-free monkey was at Morogoro, when temporarily billeted in a cotton warehouse opposite the station. A score of East African Mounted Rifles who had been there for some time, left shortly afterwards, so for a while I had the place to myself—as I thought—, inheriting a comfortable bed and other furnishings abandoned by my comrades. I very soon learned, however, that loneliness was not to be my lot! One afternoon a little black-faced guenon dropped five feet from a loft above and landed with a thud upon my cupboard.

It happened that I was resting beneath my mosquito curtain, convalescing from malaria, and was unnoticed by the monkey, who, with a grunt of satisfaction, leaped to the table. Here he picked up a piece of bread, held it to his nose, and wrinkled that organ considerably. Apparently the food passed the censor with ease for it disappeared like magic. Next the raider sniffed at a recently used soup plate, licked it, and rejected it as being no good; then, taking a third of a loaf, he bounded back into the loft with the remainder of my bread ration for that day!

For three weeks this animal was the plague of my life. When all was quiet he would come and sit on a buttress beam ten feet away—silently watching. If I feinted at throwing something at him, he promptly disappeared through a foot-high hole, only to return a minute later to grimace at me. He took to pelting me with grains of maize, and I would reply with anything handy; I never hit him, but I smashed one window and lost my boot behind a ton of cotton bales for 24 hours! I think that he really enjoyed having things thrown at him, but the moment my back was turned, down he would drop to steal something which his sharp eyes had selected. The whole neighborhood was up in arms against him, at least those on his visiting list. Some tried to make me responsible because the little beast decided to share the same roof, select-

► HE'LL CAJOLE YOU one moment and steal from you the next. But don't try to poison him, for he's quick to detect its presence. If you're a realist, you'll cater to his largely vegetarian tastes, expecting to have your household blitzed and yourself pelted with any article he may choose to throw at you



► THE GUENONS are affectionate and greatly attached to their young, risking their own lives in an attempt to protect them. Once acquainted with a person they enjoy human companionship



ing the deserted cotton ginnery upstairs for his headquarters.

At first I attempted to drive him away—a very futile proceeding. Rats would partake of cyanide placed on bread, but the monkey would only sniff at it, eat the bread, and leave the poison. Once he carried an especially attractive morsel mixed with treacle up to the loft and threw it down at me with apparent disgust. He knew all about condensed milk, would steal a tin and, ascending to the roof, hammer the can on the galvanized iron in a vain attempt to get at the contents.

After I moved upstairs, he became so bold that he would come through the window and snatch bread off my plate as I was sitting reading at the table. This audacity caused his downfall, for I encouraged him to enter through the window by generously proffering bread and treacle day after day until his suspicions were somewhat allayed. The fact that I could ill-afford to spare the food gives some indication of my desperation. Even-

tually I set a noose in the window, with one end of the cord attached to my foot beneath the table. At the critical moment I jerked the cord and my enemy was snared. Instantly he sprang out, but on feeling the noose tighten around his neck, he promptly seized the cord above his head, clambered up it, then sat in the window frame gibbering at me in the manner which has earned the guenons their name. I led him quietly across the room and tied him to a piece of machinery until he should become accustomed to captivity once more. The following morning I gave him away.

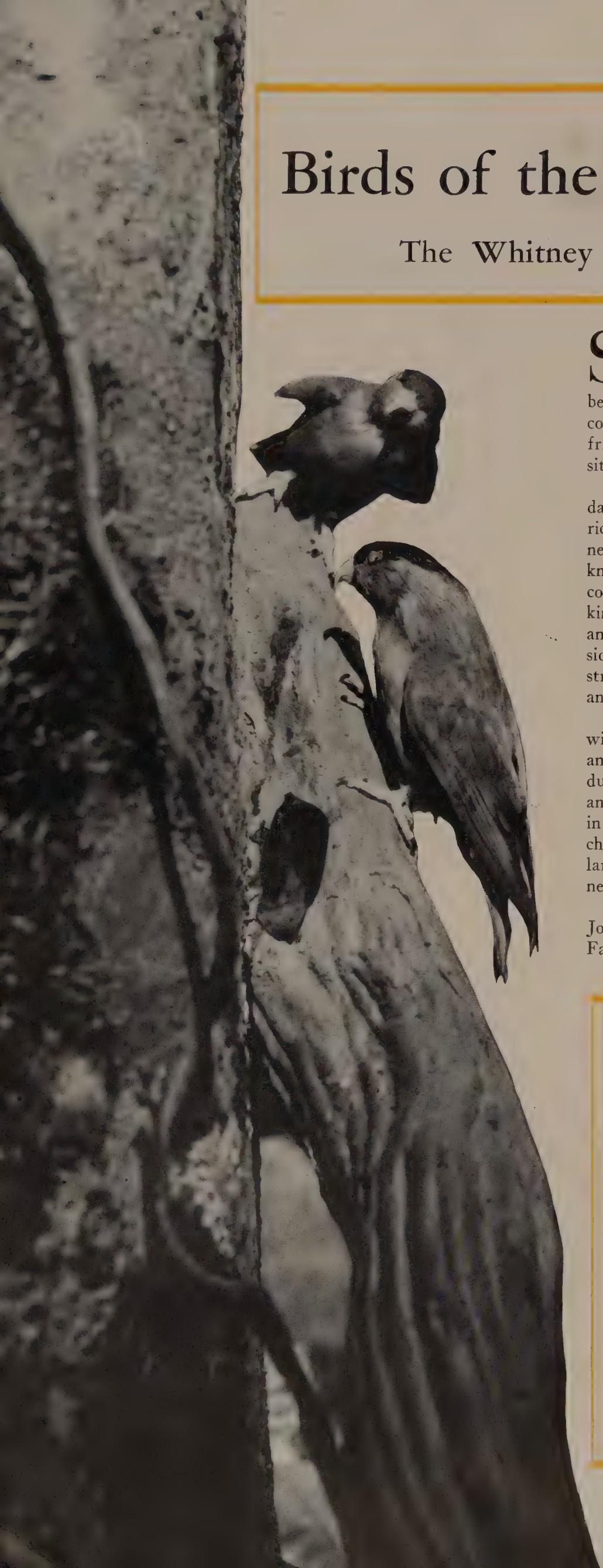
Shortly afterwards I was put in charge of a camp on the lower slopes of the Uluguru Mountains, adjacent to the Fifteenth Stationary Hospital, and so came to make the acquaintance of another ownerless monkey. Jenny, the simian Houdini of Morogoro, was known to all monkey proprietors in the district. Many times she had been in bonds, but always escaped. Yet she made no attempt to join the roving

* Pronounced to rhyme with *anon*, with a hard *g* and a nasal ending.

Continued on page 196

Birds of the FIJI ISLANDS

The Whitney Hall Exhibit of the Month



SLIGHTLY smaller in total land area than Lake Ontario, the Fiji Archipelago, pronounced "Viti" in the native language, is one of the largest and most beautiful in the Pacific. Most of the more than 200 islets comprising the group are of volcanic origin and are fringed by coral reefs which are broken by openings opposite the mouths of streams.

The five mountainous and heavily-wooded islands (Kandavu, Viti Levu, Ovalau, Vanua Levu, and Taveuni) are richer in bird fauna than any of the other islands in Polynesia. Fifty-four species of native Fiji land birds are now known. Only birds known to be able to undertake long colonizing flights are found there, such as parrots, pigeons, kingfishers, and starlings. Fiji's possession of four genera and sixteen species found nowhere else indicates the considerable age of these islands. Most of these birds are restricted to the mountains, while the common birds of town and village are of widespread or recently introduced kinds.

Fiji lies outside the limits of perpetual southeast trade winds, and the mountains of the larger islands, attaining an altitude of up to 5000 feet, are sufficiently high to produce somewhat different types of climate on the windward and leeward slopes. The vegetation is luxuriant—far richer in species than that of more easterly Pacific islands—and is chiefly of the Indo-Malayan forest type. The relatively large native population is of mixed Melanesian and Polynesian stock. The group became a British colony in 1874.

The exhibit was obtained through the co-operation of John Sheridan Fahnestock and the late Adam Bruce Fahnestock on their Pacific Expedition of 1940.

◀ FIJIAN LORIES, brilliant red and green birds, perched on a vine near a "dakua," a pine closely related to the famous kauri of New Zealand

► THE EXHIBIT represents a site on Viti Levu, the largest island. From the slope of Mt. Korombamba, at an altitude of 1408 feet above sea level, we look southwestward across the water towards the island of Mbengga. The date is July, in the heart of the trade-wind period. Perched high in the branches near the center is a golden or bright orange dove. It is not a native of Viti Levu but occurs only as a straggler from the neighboring islands of Vanua Levu and Taveuni

AMNH photos



▲ ON A ROCK overlooking a steep incline rests a Silky Dove. The exhibit portrays fifteen different species of birds, most of which are small or medium in size. The numerous plants characteristic of the region include various ferns and a pink orchid. The Fiji archipelago embraces more than 200 islets

The Creation of an Indian Jar

By TE ATA

POTTERY-MAKING among the American Indians has always been a woman's craft, although certain ceremonial vessels must have been made by the men. The potter's wheel was unknown on the American continent until brought here by the white man from the Old World, and it is still unknown to the native tribes. Indian pottery is made by the so-called "coil method."

In the olden days pottery was made to some extent by most of the tribes of the United States, except those in the Great Plains area. Among the Indians who followed the buffalo and were almost continuously on the move, breakable vessels were not practical. It was among the agricultural tribes that pottery attained its greatest development. Although beautiful pots were formerly made by the New York State Indians and by those in southeastern United States, the craft is still carried on among the Pueblo Indians of the Southwest where it has reached its highest art.

Pueblo Indians live in villages (*pueblo* is the Spanish word for *village*) in northeastern Arizona, where the Hopis dwell on flat-topped mesas, and in the Rio Grande Valley of western New Mexico.

Some of the New Mexico pueblos are also located on tops of mesas, such as "The Sky City" of Acoma. The largest pueblo is Zuni, one of the famed Seven Cities of Cibola, located near Gallup. There are about 16,000 Pueblo Indians, living in about a score of pueblos. The buildings of the pueblos are made of sun-dried brick, or adobe, the walls usually being plastered with mud. These dwellings, which are quite permanent in this "land of little rain," may be from one to five stories high (the first "apartment houses" in America), and in some cases as many as several hundred Indians may live in one building. They subsist chiefly on corn, beans, and squashes, which they raise near by.

While pottery is still made at the various pueblos, the most famous pottery maker in the Southwest is probably Marie Martinez of the small pueblo of San Ildefonso, located about 20 miles north of Santa Fe. The vessels that Marie makes are decorated by her husband, Julian,—the black pots being decorated by a method invented by Marie. The designs used are in many cases the same as or adapted from those of the old Basket Makers, who preceded the present pueblo-dwellers. Every piece that Marie and Julian make is a beautiful museum piece.



Photo by Harold Kellogg

▲ THE HISTORIC PUEBLO of San Ildefonso is situated near Santa Fe, New Mexico. One of the foremost native arts of the Southwest reaches a high level of perfection

in the pottery produced by the Indians of this village. When first seen by early Spanish explorers in 1598, San Ildefonso village was within a mile of its present site



A.M.N.H. Photo

▲ ONCE SEEN, the celebrated black ware of San Ildefonso will readily be recognized wherever it is found. It has a distinctive sheen like that of black lacquer, with designs rendered in a soft, frosted surface. Many pieces of this beautiful ware have found their way into museums and homes throughout the country

▼ MARIA AND JULIAN MARTINEZ (*see cover*) are among the most distinguished artists of the village. They find the best clay far from the village, as shown below. It is never removed from its bed without first sprinkling the place with blue corn meal with a prayer. The clay is

then placed in a bag and carried home. There it is ground and winnowed to remove gravel and other impurities and is mixed with a fine tempering material. This is a friable gray sandstone, which also has to be pulverized (*below*). Maria knows just the right proportions

Photos by Clyde Fisher





▲ WATER is added to make a paste. Maria mixes the ingredients with as much care and skill as an expert pastry cook making a pie. Meanwhile at her side a young girl of the tribe absorbs the lore of pottery-making in typical Indian fashion, doubtless dreaming of

All photos by Clyde Fisher



the day when she can carry on the art that has made her people famous. Note the turquoise and silver bracelets and necklace Maria wears, characteristic of the native-made jewelry prized by the Southwest Indians. The paste must be kneaded to just the right consistency



▲ NO GLAZE is used on this pottery. The beauty and sheen of the vessel depend upon the slip—a thin clay paste—, which Maria is applying above with a brush. This is red, although the finished ware will be jet black



▲ IMMEDIATELY after the slip is applied, the surface is polished with a very smooth pebble of quartz, which has been in use a long time. A shiny red finish results, and the vessel is now ready to be decorated



▲ ALL INDIAN POTTERY is made by the coil method. The potter's wheel was unknown in America before the coming of white men and has not been adopted. To the wonderment of spectators, Maria always pinches off just enough clay to make a coil that will reach once around



the jar without overlapping. A gourd spoon is used to give the final shape. The base of the pot is molded beforehand like a mud pie. About eight minutes are needed to mold a vessel. Next it is placed in the sun and allowed to dry until it is thoroughly hardened



▲ THE PAINT for black pottery is a mixture of white earth and a vegetable gum made from the Guaco, or Rocky Mountain Bee Plant, which Maria is gathering here. It is related to the old-fashioned spider flower



▲ JULIAN, whose specialty is painting the designs, makes his brushes of yucca leaves. Here he is fraying the end to make it absorbent. He usually uses two sizes, one for finer lines, the other to fill in solid areas



Photo by Te Ata

▲ WITH PAINT about as thin as water, the designs are painted on the polished surface of the vessel—in this case a beautiful shallow platter. Julian draws freehand and always makes the circular pattern come out even



Photo by Harold Kellogg

▲ WHEN 40 OR 50 vessels are decorated they are set on a crude grill platform for the firing. This is the last time they will be seen red with white designs, for this treatment changes their appearance

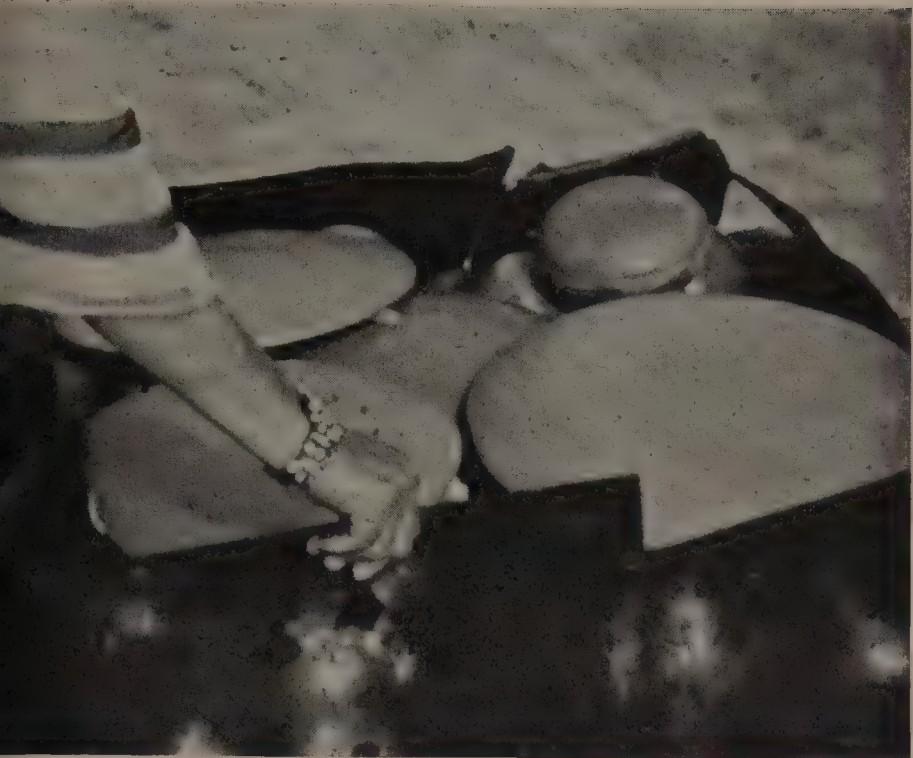


Photos by Clyde Fisher

▲ THE FIRE is kindled and allowed to burn vigorously for 20 minutes before any move is made to smudge it and force the smoke into the pottery



▲ THEN it is completely covered with fine fuel and tended for another 20 minutes. Thus the carbon of the smoke is driven into the pots to give them the black color desired



▲ THE VESSELS are placed upside down and are protected at this stage by sheets of metal to keep the fuel from touching them. Another sprinkling of corn meal accompanies Maria's prayer for a successful firing



Photos by Clyde Fisher

▲ THE FUEL is piled all over and thrust beneath the grate. Dried cow dung is used, with small quantities of cedar bark inserted in order to give the fire a good start. It is most important that there be abundant smoke



▲ HOT WORK. Maria now takes out the sheets of metal, while Julian throws on ashes. The whole kiln is now completely covered and no smoke arises



Photo by Harold Kellogg

▲ AFTER COOLING awhile, the pots are removed, the ashes dusted off. All shine with a beautiful ebony luster—perfect examples of the ware that has made San Ildefonso famous



Wildlife of Tanganyika

Attractive scenes of Africa
from Akeley African Hall

All photos AMNH

As every visitor realizes who has seen them in the American Museum of Natural History, the 28 habitat groups in Akeley African Hall constitute a composite image of Africa. In them one sees the varied and spectacular wildlife of an entire continent, true to nature in every scientific detail and portrayed with a degree of artistry unexcelled anywhere in the world.

Visitors are immediately aware that not only the animals but many of the foreground accessories such as trees, grass, sand, and rock were brought from the very spot in Africa they portray. Ranging from desert to jungle and from mountain to plain, these exhibits offer a broad lesson in geography as well as in the natural history of the vast land that was called the Dark Continent before the originator of this Hall, the late Carl Akeley, popularized the phrase Brightest Africa.

◀ "CAMEL" OF EAST AFRICA, the gerenuk. The camel can go for days without water, but the gerenuk is said not to drink even in the well-watered Tanganyika country. Its long neck and limbs are well suited to the life of this aberrant member of the antelope family. The gerenuk is a wanderer found from Somaliland to Kilimanjaro

► THIS GERENUK might have been selected by Grimm for one of his fairy tales. Its scientific name, *Lithocranius walleri*, may seem long, but so is the animal when it reaches for its diet of twigs and leaves on the uppermost branches of the rich Tanganyika bush. The horns of the buck (*opposite*) are heavy and have a peculiar forward curvature at the tips. The coat is red-fawn, with a broad band down the back. The gerenuks are found in small herds



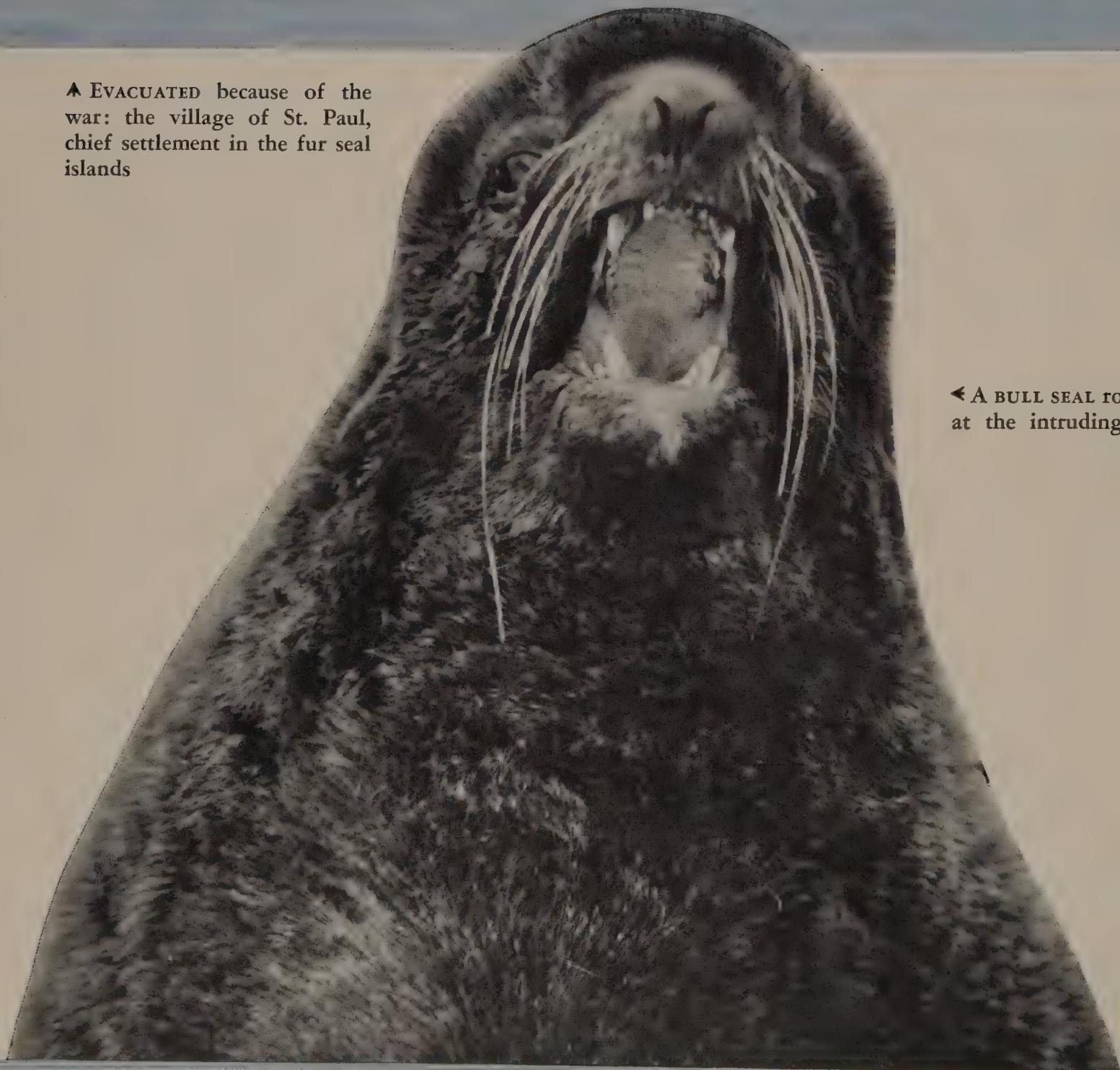
▼ NATURE DID NOT GIVE the female impala horns to protect herself. But the male has large lyrate ones. In the group are shown four stages in the development of the male horns. This animal, unlike the gerenuk, requires a great deal of water. Impalas associate in herds in the parklike acacia forests of Serengeti Plains. They are noted for their grace and their habit of taking extraordinary bounds when alarmed. It is interesting that both the impala and the gerenuk are related to the gazelle, though they do not look alike



Uncle Sam's Prize Fur

▲ EVACUATED because of the war: the village of St. Paul, chief settlement in the fur seal islands

◀ A BULL SEAL roars his anger at the intruding cameraman



Factory Closes Down

By BEN EAST

All photographs by the author

▲ A HAREM of more than 100 cows belonging to the large bull at the left: a characteristic scene along the beaches of the Pribilofs. During the breeding season the bulls neither eat nor drink for three months

Two million fur seals gathering each spring on the lonely Pribilofs in Bering Sea form one of the world's great natural history exhibits. This year they will find their human neighbors gone

THE biggest and most profitable fur farm in the world, Uncle Sam's huge, natural seal ranch on the Pribilof Islands of Alaska, is shut down, probably for the duration.

The bleak and foggy Pribilofs, whose great herd of fur seals has yielded in recent years a cash crop valued at \$2,000,000 to \$3,000,000 annually, are unpeopled now for the first time since their discovery by the Russians in 1786. The seals had the rocky beaches to themselves last summer, unmolested by the Aleut killing crews that have taken the harvest for more than 150 years.

The United States Navy evacuated the native population of the Pribilofs to a place of greater safety in southeastern Alaska last June, and sealing operations came to an end. It is not likely they will be resumed while the war lasts. The Pribilofs are outposts,

highly vulnerable to surprise raids. This is the first time since 1916 that the Government has failed to take its harvest of seal skins on the historic Bering Sea Islands of mist and blood.

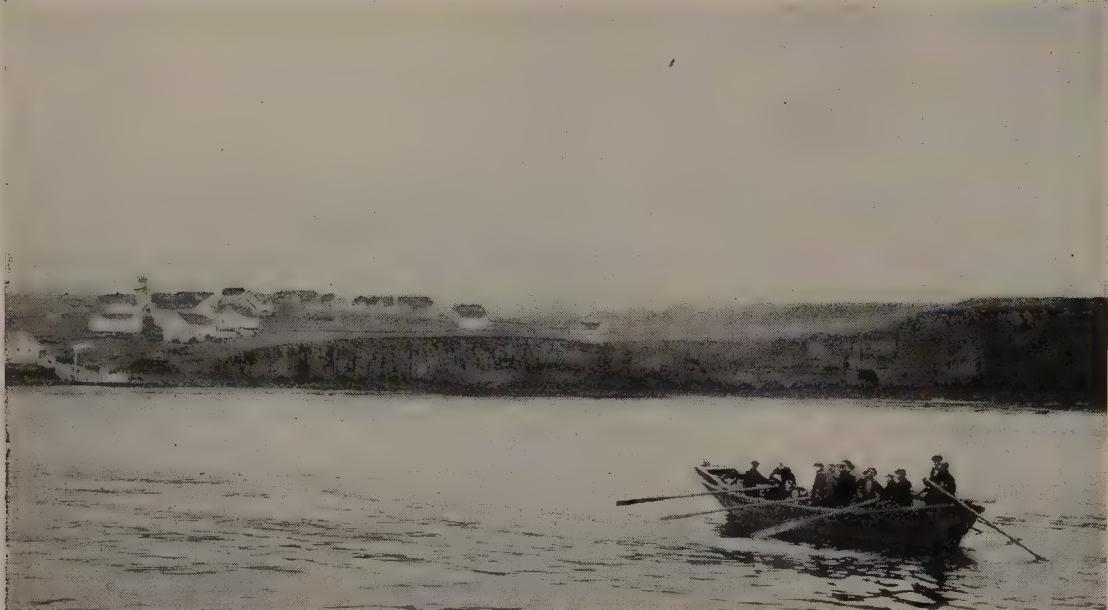
There is, of course, a slim chance that Japanese landing forces which established themselves early last summer in the western islands of the Aleutian chain, some seven hundred miles from the Pribilofs, may have invaded the fur seal islands and killed as many seals as they could in a flying visit. If that has occurred, however, the American Navy, keeping watch at its Dutch Harbor base less than 250 miles to the southeast, has made no announcement of the raids.

There are two reasons why Tokyo might be tempted to try a raid on the Pribilofs. The first is an ancient grudge, held by Japan for 37 years. In 1906, when the United States was

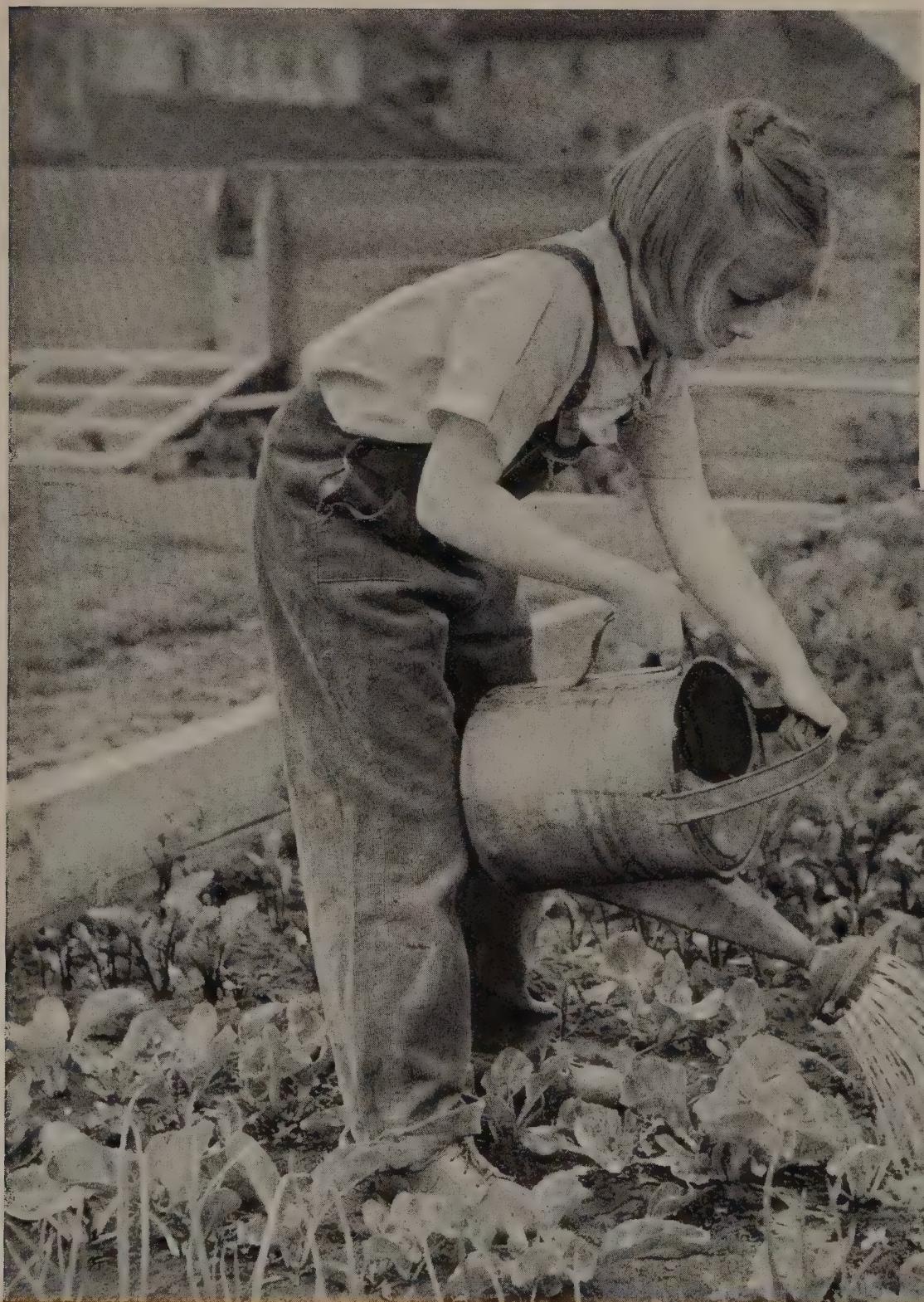
waging a losing fight to protect the dwindling seal herd and before pelagic sealing was banned by a four-power treaty signed by this country, Great Britain, Russia, and Japan, Japanese poachers gave American agents on the Pribilofs considerable trouble.

Aleut sealers on St. Paul Island finally fired on a party of Nipponese poachers that came ashore in heavy fog, killing five or six. The incident created a sharp exchange between the two governments, and from that date to the present war the Aleuts of St. Paul and St. George dreaded Japanese vengeance.

The second reason for a raid on the islands is the fur itself. Japan has kept a covetous eye on the growing herd in recent years. In the fall of 1940 she served notice she would terminate, a year later, the treaty forbidding pelagic or open-sea sealing.



◀ ST. GEORGE, a smaller village than St. Paul, is also deserted now. The seal herds begin along the beach a mile to the right of this picture and extend along the shores of the fur seal islands for many miles. The boat in the foreground is a native baidarka, made of canvas stretched over a wooden frame. Originally sea lion skins were used. Early Russian influence is seen in the church at left

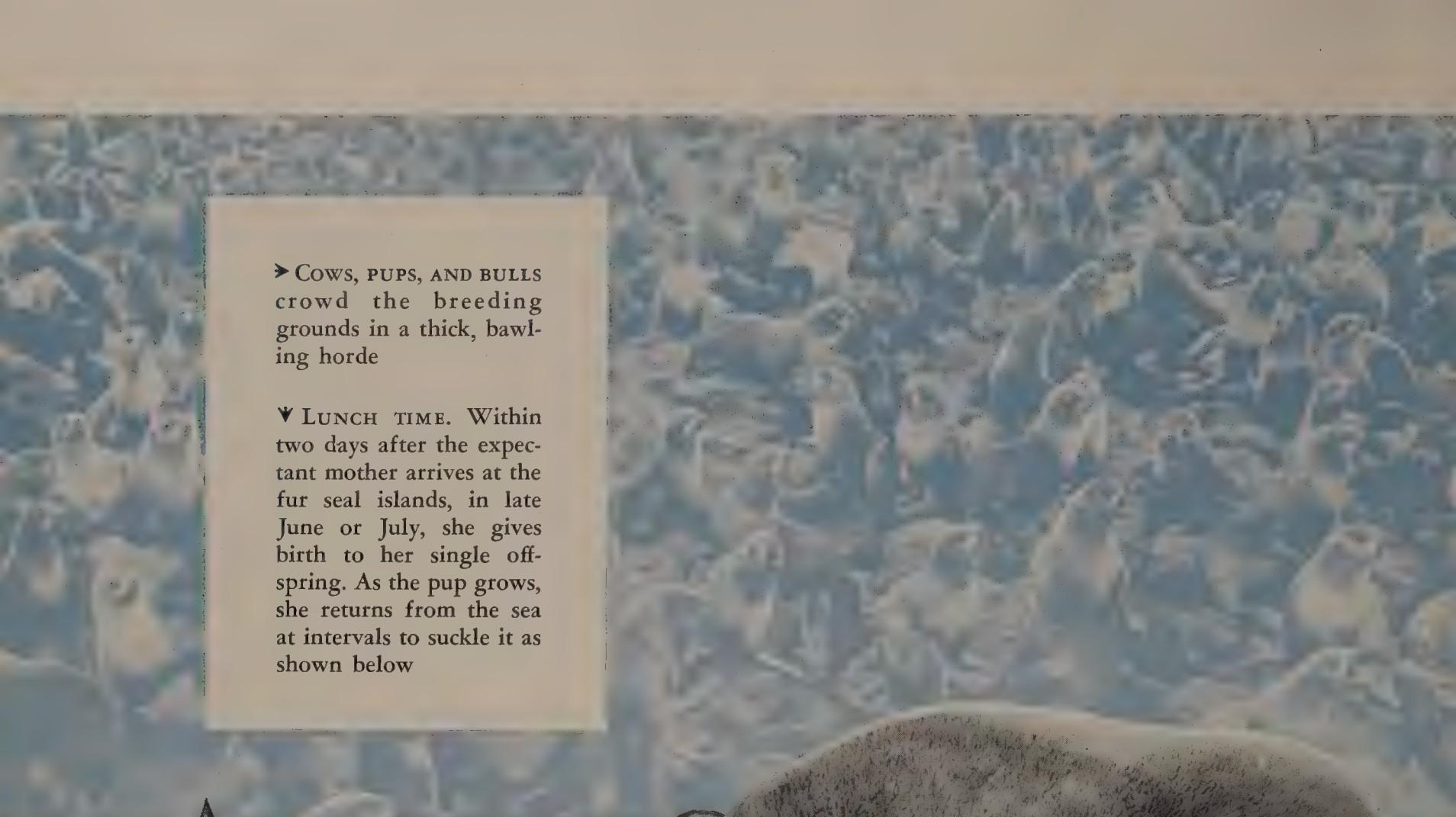


◀ LIVING BEYOND THE TREE LINE, the few white families on St. Paul nevertheless grew vegetables in a community garden in the summer of 1941



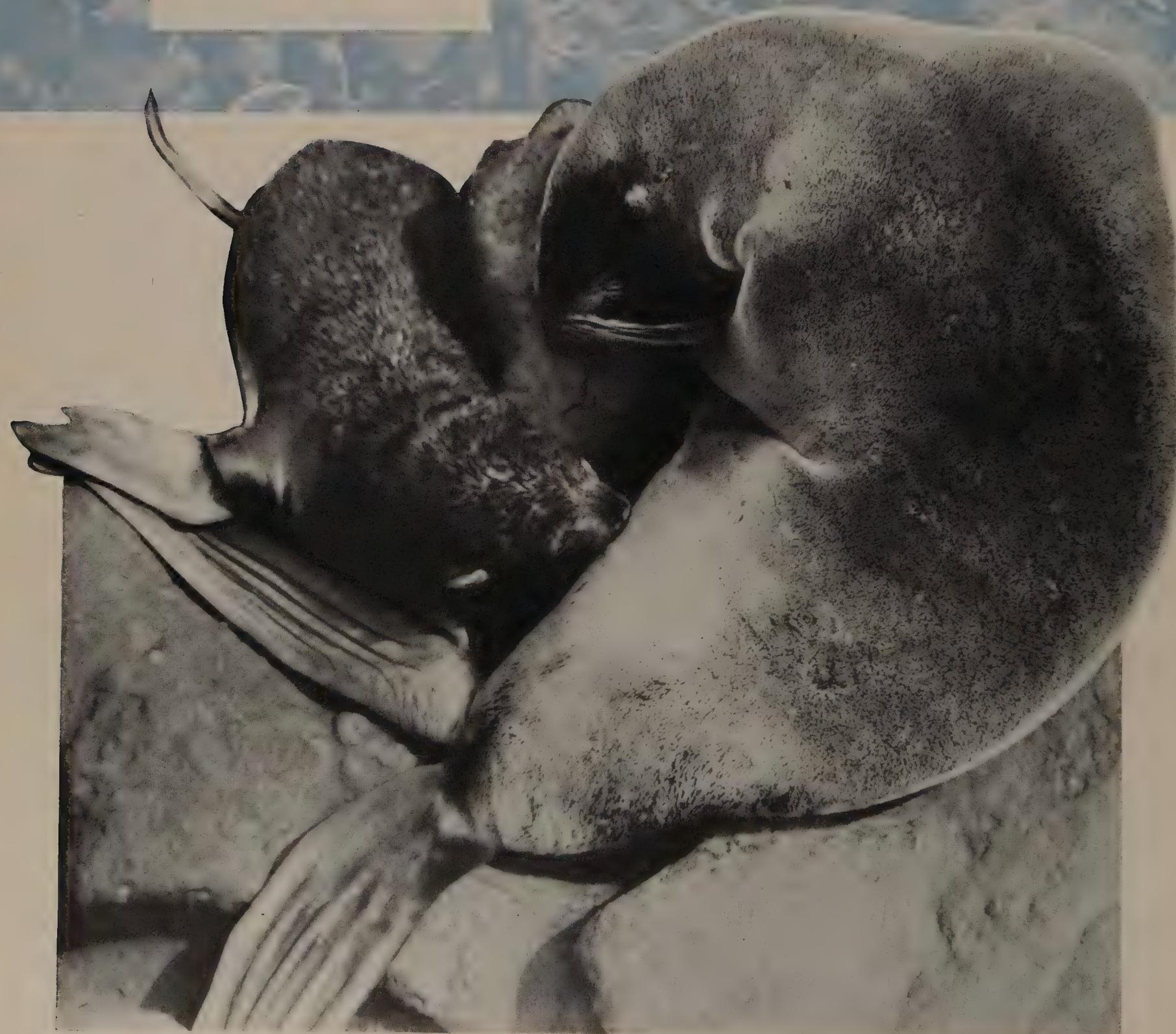
▲ CHILDREN on St. Paul Island brought together by a lollipop party: a cross section of the population now removed

to a place of greater safety in southeastern Alaska. Some plainly show their heritage of mixed Russian and Aleut blood



► COWS, PUPS, AND BULLS crowd the breeding grounds in a thick, bawling horde

▼ LUNCH TIME. Within two days after the expectant mother arrives at the fur seal islands, in late June or July, she gives birth to her single offspring. As the pup grows, she returns from the sea at intervals to suckle it as shown below



If certain Chinese and American strategists are correct in believing that Tokyo contemplates a surprise attack on Russia, then Japan may well have a double reason for wanting to take the Pribilofs and hold them long enough to slaughter 200,000 to 500,000 seals. Remembering the bitter lesson learned by her German ally on the Russian front in the winter of 1941, she may want fur clothing for a Siberian army badly enough to risk a big-scale raid on the seal islands. There is no storehouse of fur in the world to compare with them, as Tokyo well knows.

The Pribilof seal herd is one of the great wildlife spectacles of the world.

When Gerassim Pribilof discovered the islands in 1786, an estimated four to five million seals lolled and bawled and fought and bred and suckled on the rugged, boulder-strewn beaches of St. George and St. Paul.

Reckless over-killing without re-

gard to sex or age so reduced the herd in the first 20 years that the Russians found it necessary to suspend killing for two years in 1806. In 1822 provision was made for the protection of enough young seals to serve as breeding stock. By 1834 the herd had yielded 1,800,000 pelts, and another crisis arose. All sealing operations were halted once more. From that time on the Russians killed no cows.

When we acquired Alaska in 1867, it was estimated the seals numbered hardly fewer than two million. A troubled period followed. Pelagic or open-sea sealing took such a terrific toll that the herd was down to 125,000 animals in 1911, when years of protest and controversy on the part of the American Government finally brought the four-party treaty banning pelagic sealing. In return, we ceded to Great Britain, Japan, and Russia 15% each of the annual take of pelts.

Russia later dropped out of the agreement when we did not recognize the Soviet Government after 1918. She has never undertaken any sealing operations at sea, however. The 15 per cent clause of the treaty was observed with Japan and Canada up to the outbreak of the present war.

Careful management of the seal herd and the killing of none but young bachelor bulls has achieved one of the most spectacular results in the history of wildlife restoration. The 1941 census of the herd showed 2,250,000 animals. The 1939 take was 60,000 skins, that of 1940, 65,000. In the summer of 1941 we harvested 95,000 pelts.

The American fur seal herd has no other land home than the Pribilofs, and no seal sets a flipper ashore from the time the animals leave the islands in the autumn until they return in spring.

The mature bulls make a short migration and are first to return. In



THE BIG-EYED YOUNG are covered with short black hair and are known for their appealing ways

a mild winter they may spend the entire year around the islands. In severe winters they drift south to the Aleutian Islands or the Gulf of Alaska.

In late April or early May the beach masters begin to arrive and come ashore. Each selects his harem ground for the season, and for 90 days he does not leave it to drink or feed.

By early June the cows arrive from winter haunts as far south as California, almost all pregnant from the previous summer's breeding. As they come ashore the bulls coax, drive, or carry them into their harem areas; and as the migrating cows arrive by the increasing thousands, the noise and fighting and confusion mount to a frenzied climax.

The harems are crowded close together, so that the cows of one harem literally touch those of the next. The bull makes every effort to keep his harem from straying, and his methods of domestic discipline are by no means gentle. Since he weighs 350 to 450 pounds and the cows only 70 to 75, he is in a position to enforce his will.

Within six to forty-eight hours after she arrives, the cow gives birth to a single black pup, and within an-

other five or six days she is in heat and ready to be bred again.

After mating, the cow is no longer of interest to the bull and is permitted to return to the sea to feed. She comes back ashore every so often to single out her pup from the thousands in the teeming rookery and suckle it.

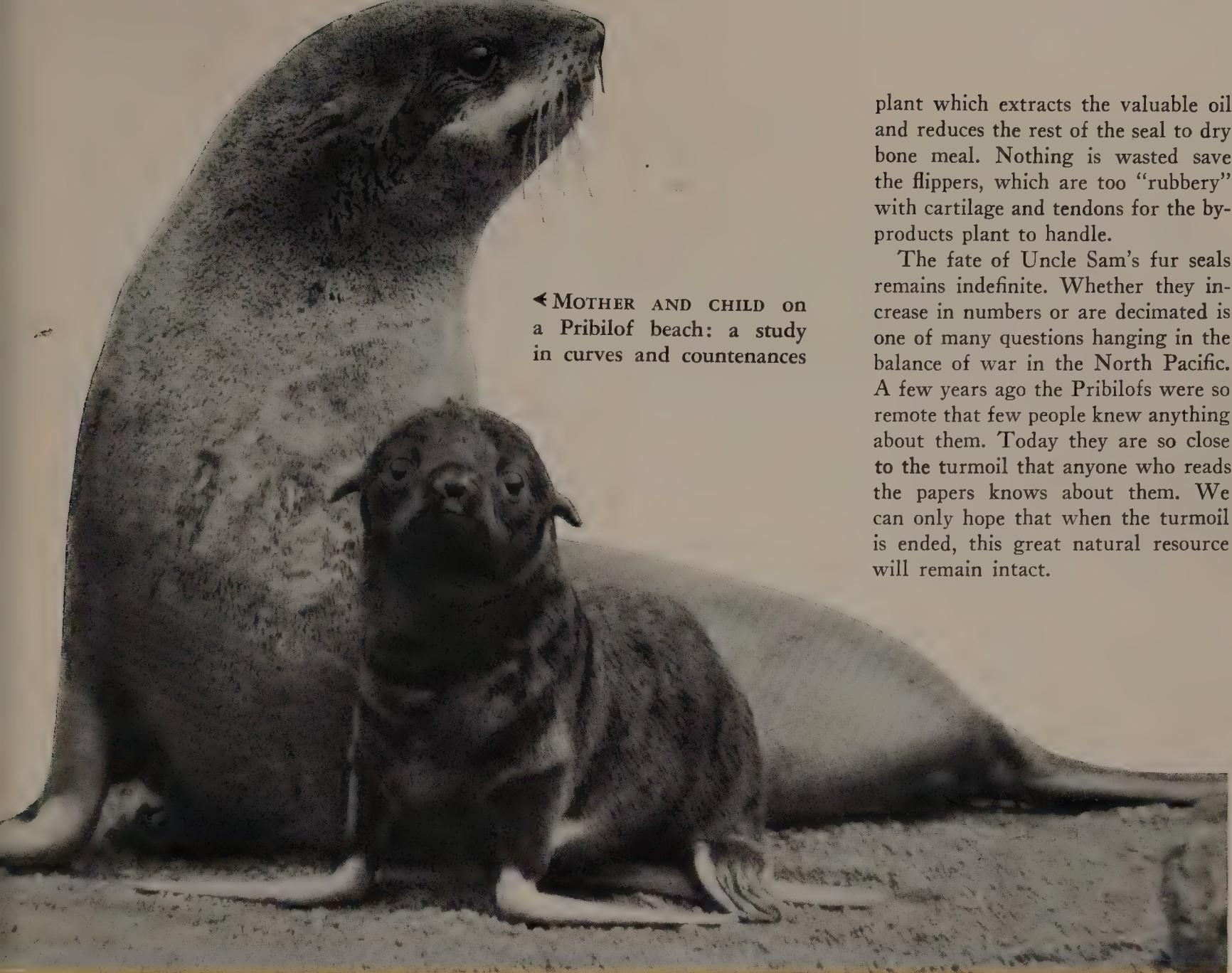
Harems range from one cow to well over 100, depending chiefly on the location and herding instinct of the animals. For three months the harem master remains almost continuously on the alert, guarding his home area, collecting cows, riding herd on them, fighting his neighbors, fending off the raids of younger "idle" bulls not quite old enough to collect a harem in the hard way. He accomplishes this without eating or drinking, and without sleeping much, and comes off the harem at the end of July a frame of bones encased in a loose bag of skin.

Managed killing is made easier by the habits of the seals themselves. The bachelor bulls, two- to five-year-olds, "haul out" on their playing and sleeping grounds by themselves, well away from the quarrelsome old harem bulls. On these hauling grounds at each

rookery the Aleut sealing crews round up the youngsters and drive them inland to level ground where thick grass will protect the pelts from volcanic cinder. The driving is done in late evening or early morning, to avoid the "heat" of the cool foggy days. Three-year-old bachelors are chosen for the fur. Others in the drive are rejected and allowed to return to the sea. The work is as efficient as that of any modern slaughterhouse and as humane and swift as it can possibly be made.

Later the pelts are collected in trucks and taken to the salt houses in the villages, to be scraped, salted, and shipped to a St. Louis, Missouri, fur dressing firm. The carcasses are collected and put through a rendering





◀ MOTHER AND CHILD on a Pribilof beach: a study in curves and countenances

plant which extracts the valuable oil and reduces the rest of the seal to dry bone meal. Nothing is wasted save the flippers, which are too "rubbery" with cartilage and tendons for the by-products plant to handle.

The fate of Uncle Sam's fur seals remains indefinite. Whether they increase in numbers or are decimated is one of many questions hanging in the balance of war in the North Pacific. A few years ago the Pribilos were so remote that few people knew anything about them. Today they are so close to the turmoil that anyone who reads the papers knows about them. We can only hope that when the turmoil is ended, this great natural resource will remain intact.

SEAL COURTSHIP. A cow (*right*) barks her blandishments, while her lord and master (*left*) appears more interested in the photographer. The male is always much the larger animal. From fall to spring not a seal sets flipper on the rocky Pribilos, and the cows roam as far south as California. Yet the Alaskan fur seal knows no land home other than these tiny dots in fogbound Bering Sea



MONKEY BUSINESS

Continued from page 177

bands which often came within sight of her haunts. Jenny was a familiar object at the hospital, where she could be seen sliding down tent ropes, racing through the wards, or perched upon the foot of a patient's bed, refusing to be cajoled within arm's length by tidbits. She preferred to snatch a biscuit or some other coveted object from the bedside table of a dozing man; then she would retire with her loot to the ridge pole of a marquee. This freebooter was also addicted to paying calls on the captive monkeys, whom she alternately fondled and robbed.

I had, at this time, acquired three monkeys of another species (*Cercopithecus mitis albicularis*), and to one of these Jenny became a regular visitor, making friendly advances, then snatching away Kima's food. Frequently insult was added to injustice by the thief serenely eating the stolen morsel within a yard or two of her victim, who, tugging and straining at her chain, would disturb the peace with her piercing denunciations.

On my approach Jenny always took to the trees, but after a time I induced her to sit on the high reed fence surrounding my quarters by holding out at arm's length a pawpaw fruit at which she would furtively nibble. If I attempted to bend my arm so as to shorten the distance between us, instantly Jenny would be a dozen feet away. One day I instructed a native to go to the farther side of the fence and, after I had engaged Jenny's attention with the offer of fruit, seize her by the tail.

"Oh, but she will bite me," he exclaimed.

"Never mind," said I, "you shall have 50 cents (= 12 cents U. S.) if she does."

The plan worked; and when Salimu caught hold of her tail she made no attempt to bite, only threatening to do so and indulging in a "frightfulness" demonstration. Raising her bushy, white eyebrows, she opened her mouth till her lips formed a great round "O," and punctuated this display with menacing chattering. The effect is startling, especially when accompanied by a short rush, but the facial expression is so like a caricature of human astonishment that it is apt to make onlookers laugh—which has the effect of annoying the monkey more than ever!

On the third day of her captivity

Jenny gnawed through the telephone wire that connected her belt to a ring which slid up and down the pole on which was her sleeping box. I re-caught her the same afternoon and substituted a light chain for the wire. After several futile attempts to gnaw through the chain Jenny settled down and became quite affectionate. One day my servant, Salimu, killed a rat as it ran from my tent. He was about to carry the corpse away when Jenny, who had watched the hunt with great interest, evinced so much eagerness to have it that I stopped the boy and

tossed it to her to see what she would do with it. First, seizing the tail in her mouth, she defied anyone to take it from her; then, she subjected the rodent to a critical examination. She opened the mouth and looked inside; next, she examined its fur minutely and appeared to pounce upon some fleas which she may have found there. After this she climbed the pole to her box and sat on top of it with the rat between her knees, nursing it in a manner that was truly comical. For two days she clung to this rat, guarding it closely and defeating our every attempt to deprive her of it, despite the fact that it was badly decomposed. Much of the fur had slipped, and bluebottles buzzed about her face as she carried the corpse about! This strange behavior was doubtless a manifestation of some misdirected maternal instinct, for Dr. Ray Carpenter has filmed a pictorial record of a rhesus monkey which carried about the body of her dead baby until nothing but skin and bones remained.

Alas! as so often happens with pets, Jenny's end was tragic. Two months after the episode with the rat there were signs that some food had disagreed with her—she had partaken too freely of jam on the preceding day. In the morning she was lying on her side toying with bits of gravel. I released her immediately, and she took a little milk and sugar; she then went to a washbasin in which she plunged her hands while drinking deeply. I lifted her onto the bed and she bit me. When I endeavored to make her comfortable, she arose and went to the other monkey, throwing herself down beside Kima in a very exhausted manner. The Blue Monkey showed her sympathy by trying to clean Jenny's fur.

The next morning she wandered about the adjacent scrub. Hoping that she might find something by way of medicine for herself, I gave orders that she was not to be molested. At four o'clock she came walking back, and when Salimu laid her on the bed in my quarters she looked most humanly forlorn. Almost immediately, however, she sprang up with considerable agility, climbed a wire rope, hurried across the top of my python's cage, and ascended the pole to her own box. I remarked to Salimu that perhaps she was not as ill as we had supposed. How grossly I had misjudged her was revealed next morning when we found her lifeless body a short distance away.

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BAT FISHERMEN



By JOHN ERIC HILL

Drawing by

G. FREDERICK MASON

IN the spring a man's fancy is wont to turn to thoughts of fishing. Memories of the pleasures of that sport occupy his moments of leisure, sometimes to the detriment of his work. Boys will get bent pins, string, and a stick, almost any stick, or if they are more fortunately situated they will get more suitable tackle, dig for worms or catch grasshoppers, and haunt the shores of ponds and streams. Even the lake in Central Park, New York, will be fished with patience, though to little profit. But the industriousness of fishermen is not greater than their pride in their catches, and each one, young or old, feels strongly the loss of the fish that get away.

Although there are about 1000 different bats, only three are known to be fishers, two of them American. One is the bat shown in the cartoon, the mastiff bat of the American tropics, called scientifically, *Noctilio leporinus*.

It is quite as ugly-looking as the picture, and one of its most noticeable distinctions is its large hind feet with heavy claws. The other species is a bat found on the islands and shores of the Gulf of California, called *Pizonyx vivesi*. So little known is this bat that it has no common name. Long before there was any proof that it caught fish for a living, its large feet and claws, so like those of the mastiff bat, led scientists to suspect that it did. Later the examination of stomach contents and the analysis of the droppings showed that this supposition was correct; in fact, no other remains of food were found but fish.

The mastiff bat lives in caves,

crevices of rocks, or hollow trees, and it does not restrict itself to fish-eating. Many sorts of insects are captured in the air by the bat's big feet and the membrane between the legs and tail. Its sharp-pointed cheek teeth cut up the hard bodies of even beetles into minute pieces, but the food can usually be identified. When these bats live on the sea coast or in other situations where small fish abound, they fly out over the water in the evening, glide down to its surface, and scoop up their prey. If pelicans are also fishing, it is even easier for the bats, for some fish are injured by the birds and others are frightened to the surface.

If a mastiff bat gets knocked into the water or caught by a wave, it swims well and can take off from the water again, unless some larger fish should turn tables and strike the bat.

The fishing bats of the Gulf of California live with petrels in crevices and rock-slides, apparently in harmony with the birds, and they are not known to live away from the sea shore. No one has yet watched them fishing, for they stay in their retreats until after dark and come home before the dawn.

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YOUR NEW BOOKS

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GARMENT OF GOD • OLD BAY PATHS • PACIFIC BIRDS

REDISCOVERING SOUTH AMERICA

- - - - - by Harry A. Franck

J. B. Lippincott Co., \$3.00

AFTER a lapse of more than a quarter of a century, Major Franck revisits the scenes of his earlier adventures. Where on former trips he traveled afoot, he this time covers in a few hours by plane distances which would have taken weeks. Those of us who have enjoyed others of his books will find this no mere repetition. As we might expect, his descriptions of places and people hold the reader's interest, are timely, and have the added advantage of his earlier experiences. Some people may disagree where he expresses his own likes and dislikes. For instance, those of us who are partial to Chile and the Chileans will regret some of his remarks of a more personal nature, although on the whole he does give a clear general picture of that country.

It is interesting to note the changes which have occurred: remote areas now easily accessible; forests changed to farm land; the development of "nationalism" in the various countries; the lessening of local differences in costume and customs, and many others. Not only is his account entertaining; it is of value to all those concerned with the development of South America.

JUNIUS BIRD.

THE OLD BAY PATHS

- - - by George Francis Marlowe
With Photographs by Samuel Chamberlain

Hastings House, \$2.00

THE network of highways between Boston and Hartford were in large part originally Indian trails. On the coming of the white man, many of these were widened to become bridle paths, woods roads, and public roads, and more recently some have developed into the broad concrete highways of today. This is a fascinating little book about "their villages and byways and their stories." The 52 photographs by Samuel Chamberlain illustrating the text are superb and add much to the interest and attractiveness of the volume.

The running story of the origin and routes of these old Indian trails, carried through the pioneer history of New England, is unobtrusively documented by references at the end of the book, and this gives the reader the feeling that it is dependable history. At the same time,

the author has made it very human by including personalities and anecdotes, such as taking as a souvenir the bell from the engine-house, which had been John Brown's headquarters at Harper's Ferry, to Marlborough, Mass., where it now hangs in Grand Army Hall; the romantic story of Sampson Wilder and his preparation of the haven of refuge for Napoleon at Bolton; the account of Jack Straw, the Croatan Indian who had been taken to England by Sir Walter Raleigh and presented to Queen Elizabeth; and the amusing experiences of the celebrated Sarah Knight, a school teacher of Charlestown, who at one time had Benjamin Franklin as a pupil.

The traveler who is interested in the early history of New England will find this an excellent guidebook in unraveling these old paths, especially if he is willing to negotiate some of the way on foot.

CLYDE FISHER.

NOW THAT WE HAVE TO WALK

- - - - by Raymond Tiffet Fuller
E. P. Dutton & Company, \$2.50

M. R. FULLER, taking advantage of the present shortage of gasoline, has provided us with a number of reasons to walk. All of his reasons are excellent ones. They have to do with intimate glimpses of bird, animal, and plant life in the field. Particular emphasis is given to seasonal excursions, and we are informed that the immediate neighborhood, adjacent to our homes, will provide endless opportunities to become acquainted with woodland neighbors.

Mr. Fuller presents a six-point program. The first step suggests that we determine to take up walking, bicycling, and a nature hobby. Second, "buy one or two or three handbooks pertaining to your selected hobby; make the local museum and/or library an additional authoritative reference book on the subject. Third, force yourself to get out-of-doors as often as possible . . . choose at least one ample rambling-range, explore it, learn it . . . always wear your oldest, most worn-out clothes and shoes . . . and like them!"

There are several other points, too, but we are particularly glad that "worn-out" shoes are emphasized. Mr. Fuller no doubt was a prophet who foresaw the coming of shoe rationing.

This is enthusiastic, philosophic writing about everyday wildlife happenings, skipping about from accounts of the author's experiences with bats, opossums, and rep-

tiles to the planting of trees, with a consideration of "America's Gamest Bird," the ruffed grouse, and a chapter entitled "Humility Before Bees." Thrown in for good measure is some advice concerning interior house painting and the rescue of bricked-up fireplaces in old houses. The book is stimulating, interesting, and exceedingly readable.

W. H. CARR.

KEY TO THE NESTS OF PACIFIC COAST BIRDS

Oregon State Monographs, Studies in Zoology, Number 4

- - - - - by Elmo Stevenson

Oregon State College, 50 cents

BIRDS' nests offer an attractive field for study, and there is much to be learned from them even after the birds are through with them. Their wholesale collection, even after the breeding season, is open to some objection, however, for there is no way of assuring that the nests are taken after the birds have left. Game laws are justified, therefore, in prohibiting their collection or possession except under special permits.

Nevertheless, nests may be studied in the field, and for the species of birds found on the Pacific Coast the present booklet will be found very useful. It classifies the nests according to their materials, shape, size, and position, and gives the number and color of the eggs as contributory data. Photographs of the nests and eggs of 75 species are shown on the plates, as preserved specimens or in their natural positions, and form a useful adjunct to the text.

JOHN T. ZIMMER.

THE INDIAN SPEAKS

- - - - - by Marius Barbeau and Grace Melvin

The Caxton Printers, Caldwell, Idaho, and
The Macmillan Company of Canada,
Toronto, \$3.00

ANY book that conveys with fidelity the thoughts and feelings of one race to another has its place in literature. *The Indian Speaks* is such a book, and the title is an apt one. The myths, songs, and stories of the American Indian hold great fascination for young people and adults as well. Ethnological students have spent years of study in this field, the results of their research having been pub-

lished usually in formidable reports or filed away and not yet available to the general reader.

Doctor Barbeau is anthropologist and folklorist of the National Museum of Canada, and the coauthor is the Head of the Department of Design in the Vancouver School of Art. The authors, who have collaborated in the preparation of the texts and the 40 excellent drawings, have kept themselves in the background and have allowed the Indian to speak for himself. There are contributions by the Rocky Mountain Indians, the Blackfoot, the Iroquoian, and the Algonkian. A few stories are from the Mackenzie River Athapascans. Some are from unpublished texts in the National Museum of Canada.

In the myths we are told "how the world was created, how the Earth-Mother holds up our island—America, how the Great Raven conjured the first people out of a clam shell into the world, how Asentma sang the song of life and brought forth the wild animals."

Instead of abridging the speech of Chief Logan, the Mingo, which won acclaim as Demosthenian from Thomas Jefferson, we wish it had been given in entirety. It is so short, and is generally considered the supreme speech of its kind in Indian history.

A delightful story, especially for those who believe the Indian has no sense of humor, is that of "The Last Pagan," who left his three wives and chose a new one in order to come into the Christian church as a monogamist. As his former wives were all equally fine and valuable, he would not hurt their feelings by an unfair choice.

In this volume we have a well selected collection, carefully documented as to source, that in brief space and readable form gives us a wealth of American Indian folklore.

TE ATA.

CARNIVOROUS PLANTS

----- by Francis Ernest Lloyd

Chronica Botanica Company, Waltham, Mass.; G. E. Stechert and Company, New York City, \$6.00

THE field of carnivorous plants has always been one of the most fascinating to the student of plant life, as well as to the nature-lover. Much has been written by famous scientists of the past and present on this subject, but the material is so widely scattered that a great deal of time must be spent to bring together all of the published information. Doctor Lloyd does all this in review form, making it readily available in a single book for the benefit of the interested reader, and to it adds the results of his own lifetime of study upon this interesting phase of nature. Here, to quote the author, we have for the first time "an historical review and summary of our present knowledge about the carnivorous or insectivorous plants."

The form of presentation is thorough and entirely satisfactory, giving general descriptions of the plants, their natural habitats, their anatomy and physiology. Most interesting of all to the general

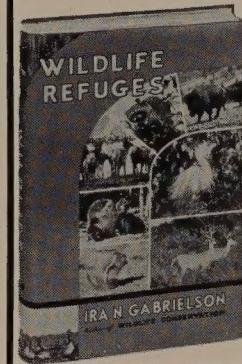
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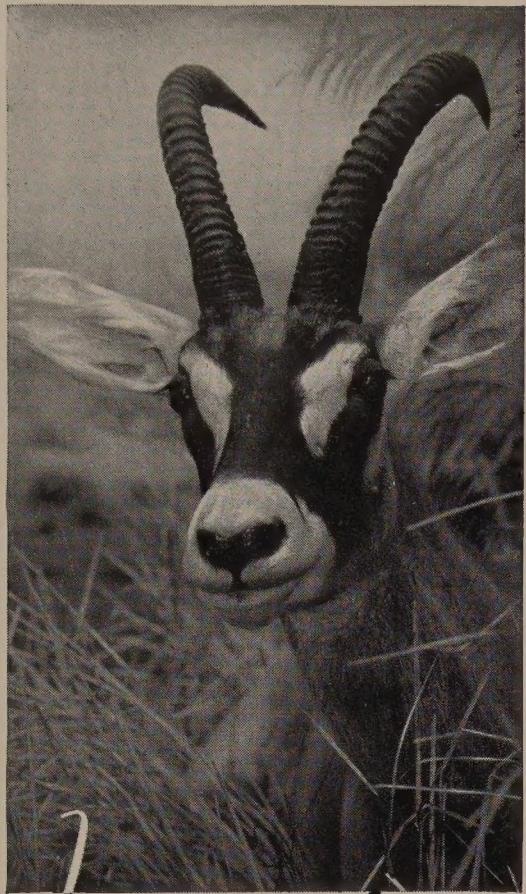
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Above illustration—Nile River Group—Detail showing Antelope
Akeley African Hall—American Museum of Natural History



BOOKS

Continued from page 199

reader is the part on the structure and mechanism of the different types of insect-traps and the manner of digestion of their prey so far as it is known.

The format of the book is European rather than American in style, but this has much in its favor in view of the subject matter. A great convenience for reference and study is the repeated chapter numbers and headings at the top of every other page somewhat in dictionary style. The only flaw one can find is the antiquated style of placing the plates together at the back of the book rather than within their respective text portions. The half-tones are not of a quality comparable to the rest of the book and do little justice to what must have been excellent photographs.

The book may be highly recommended to the interested student or reader who can afford to indulge in such an unreasonably high-priced book.

E. J. ALEXANDER.

THE GARMENT OF GOD

— by John C. Merriam

Charles Scribner's Sons, \$2.00

THE author of this little volume is one of our leading scientists. For many years he taught paleontology and historical geology in the University of California. Since 1920 he has been President of the Carnegie Institution of Washington and Regent of the Smithsonian Institution, having retired from the former position after nearly 20 years of service. Perhaps his dominant interest has always been the influence of nature upon the lives of men, which is the theme of this book, and the concomitant interest in the preservation of our natural wonders.

This book has been written from the standpoint of the poet and philosopher, with his feet always on the solid ground of nature. The third chapter, entitled "Types of Inspirational Influence in Impressive Natural Features," is made up of six essayettes, which remind one strongly of the writings of our literary naturalists, Thoreau, Burroughs, and Muir. The titles of these little essays range widely: "The Beeches of Adams Mill Road," "The Lake Region of England as Seen by Wordsworth," "The Grand Canyon of the Colorado," "Crater Lake," "The Redwoods of California," "The Coming of Spring."

The combination of the scientist and poet is evident in the statement, "While human ideas and ideals must be developed imaginatively they must rest upon facts." Doctor Merriam believes with Keats that "A thing of beauty is a joy forever," and states that "with the development of such a mental state one who has seen the Grand Canyon or Crater Lake or the prominences on the sun will have ever after a new illumination on every subject touched, whether in the vastnesses of great spectacular phenomena or in the smaller things of everyday life." He believes "that a clearer vision of nature will enhance the joy of living."

CLYDE FISHER.

DIARY OF A JOURNEY THROUGH THE CAROLINAS, GEORGIA, AND FLORIDA, JULY 1, 1765-APRIL 10, 1766

— by John Bartram
(Annotated by Francis Harper)

Transactions, American Philosophical Society, vol. 33, part 1, \$2.00

JOHN BARTRAM (1699-1777) might be described by some such anachronistic term as "illiterate scholar." A Philadelphia Quaker filled with curiosity regarding the Colonial borderlands, he set down his experiences with a prosy lack of color and imagination that contrasts strongly with the notable literary and esthetic qualities later revealed by his son, William. His knowledge of syntax and spelling were amazingly rudimentary, even for his time. Inconsistency is a first characteristic of his use of language, as exemplified in a minor way by his genius in offering seven different and equally outlandish spellings of "mosquito" in one short journal!

And yet, withal, John Bartram was the first botanist of America, the friend of savants in every Colonial center of culture, the correspondent and peer of men of science in Britain and elsewhere in Europe, including the great Linnaeus, whose unbounded admiration of Bartram is a matter of record. Through his activity in discovery and acclimatization, and the founding of a garden that still survives, his influence has been profound, far beyond the promise of his matter-of-fact narratives.

Accounts of Bartram's several travels have been published in whole or in part, but the Diary of most of the journey of 1765-1766, which took him and "Billy" from the vicinity of Cape Fear, N. C., southward almost to the source of the St. John's River in Florida, has lain in manuscript until the present day. In undertaking its publication, the American Philosophical Society (of which Bartram was a founding member) has been fortunate in commanding the services of so creative an editor as Dr. Francis Harper. With almost chauvinistic zeal, he has actually covered the greater part of the route of the Bartrams, identifying their sites and landmarks even, on occasion, to particular trees of 175 years earlier. The resulting introduction, comments, and annotated index, together with the series of 37 figures, form an illuminating critique and concordance, making the Diary an outstanding contribution to the history, ethnography, geography, zoology, and botany of the pre-Revolutionary southeastern United States.

R. C. M.

URGENT

The Museum Library is in need of back issues of NATURAL HISTORY, particularly the first four issues for 1942. Copies sent to the Librarian, Natural History, New York, will be greatly appreciated.

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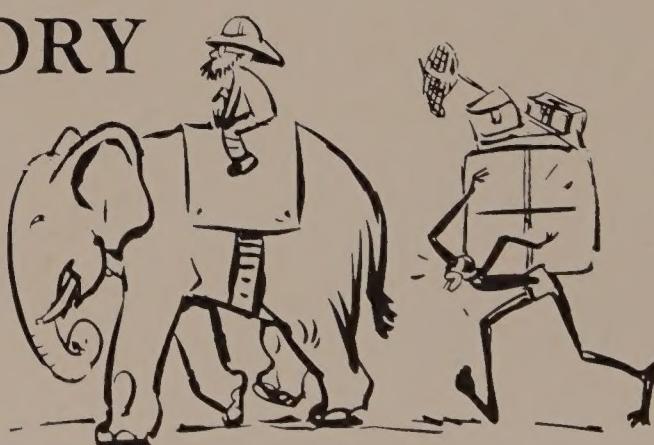
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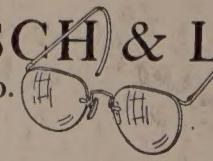
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